ROD & Custom

September, 1954

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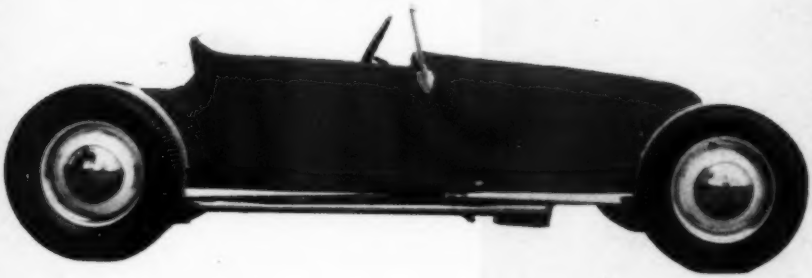
Sectioning
how and why

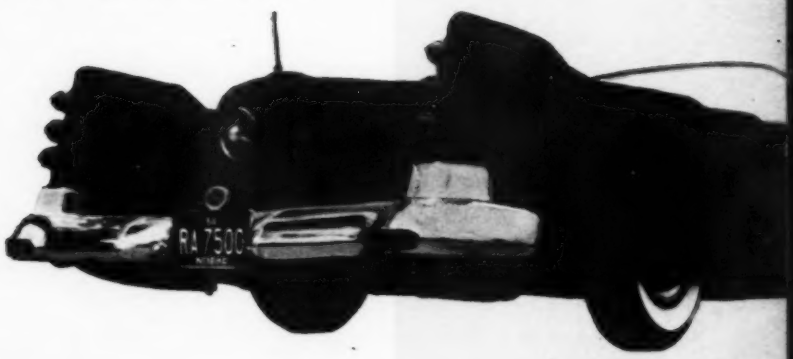
•

INSTALLING
magnesium
rocker arms

SHOW WINNING ROD



SHOW WINNING CUSTOM



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- Tires and tubes
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BE FIRST FOR FALL...Order By Mail From EASTERN

STATIONARY CHEVY CONTINENTAL KIT

Complete continental kit with bumper extensions, splash pan, tire carrier, all-metal tire cover. Stationary kit, trunk opens without moving tire. No moving parts, no hinges, no rattles.

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REALISTIC CONTINENTAL KIT

$47.95 COMPLETE

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Finger tip control, cover tilts back to open trunk. Metal covered both front and rear. Uses present holes, no drilling in body. Tire remains in trunk where safe and weatherproof. Kit complete with cover, chrome hub cap, bumper extensions, splash pan, latch assembly. Prime coat. **Merc. 1953-'54, Buick 1954, Pont. 1953-'54, Olds 1954, Linc. 1952-'54, Pack. 1954, Chev. 1953-54, Ford 1953-54.**

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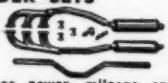

Increases power, mileage and engine life. Deep mellow tone. Complete with headers, extension, tail pipe, 2 steel-packed mufflers and brackets. Specify make and year.

Ford & Mercury, '35-'53.. $33.95
Olds, '49-'53, except power steering $39.95

Most complete ever. Includes 1954 models. Items not available in accessory stores.

ORDER YOURS TODAY, send 25c to cover postage and handling.

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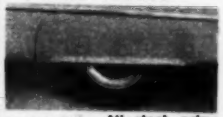

$6.90 pr. All steel, prime coat. Ford, '36-'54; Merc., '39-'54; Chev., '36-'54; Stude., '35-'52; Plym., Chrys., De Soto, '53-'54.

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Chev., 1949-'54; Chev., 1940-'41; Plym., 1946-'48; Ford, 1949-'51; Dodge, 1949; Plym., 1941.

PUSH BUTTON WINDOW LIFTS

(2 windows) SET **$39.95**

1935-'54 Ford. 1939-'54 Mercury. Genuine Trico Lifts complete with all parts and switches. Real luxury.

2-TONE CUSTOM STEERING WHEEL

1932-'54 Ford & 1939-'48 Mercury — Smart-looking, black & white combination. Solid plastic, won't chip or peel. Distinctive 4-spoke design, instant-touch horn ring of mirror-bright chrome. Machined to fit. Specify make, year.

1949-'54 Ford ... $19.95
1932-'48 Ford & Merc., $21.95

HIDE-AWAY REAR AERIAL KIT

3 section beautifully chromed hide-away aerial and long lead wire for custom rear mounting. AERIAL with 180" wire **$8.95**

Dual kit (2 aerials) 180" wire... **$12.50**

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$19.95

The finest single improvement in customizing a car. Heavy steel, beautiful chrome.

	Deluxe	Std.		Deluxe	Std.
1954 Ford	$19.95		1951 Merc	$22.50	$19.95
1953 Ford	7.50		1953 Chevy	12.95	
1949-52 Ford	19.95	$17.50	1954 Chevy	14.95	
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Deluxe Model is solid, 1 piece unit without center molding. Standard Model is 2 pieces with a center dress-up molding.

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3319 RC-9 So. Grand Ave.
Los Angeles 7, Calif.

25% deposit on all orders. Prices FOB Los Angeles. Postage COD. Add 3% sales tax in Calif.

ROD & Custom

Volume 2, No. 5 **September, 1954**

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- **Editor** — **Spencer Murray**
- **Art Director** — **Wayne Bender**
- **Technical Editor** — **Barney Navarro**
- **Advertising Mgr.** — **Marvin Patchen**
- **Photography** — **Ralph Poole**

contents

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Your Present Engine Can Last Years Longer ...Thanks to New Sintered Bronze Filter Method!

THIS IS THE SECRET that wouldn't keep—the invention that may put men on the moon years before experts believed it could be done. This is the discovery that can make present-day automobile engines last hundreds of thousands of miles—and save millions of dollars for average car owners by reducing operating expenses. Yet, like many great discoveries, it is based on simple principles.

Friction, as every schoolboy knows, is what makes engines wear out. In early steam engines, this was such a minor problem that tallow was good enough for lubrication. Even in the first gasoline engines, almost any kind of oil could do the job.

But as engine heat increased and piston speeds approached 3000 feet per minute, lubrication engineers had to develop new oils containing "additives" you hear so much about.

Oil companies claim these additives are worth the extra 15c to 25c a quart you're paying for oil—and they're right. Purpose of these additives is to keep carbon and gum in harmless suspension in your oil—prevent deposits from forming in your engine. That's why your oil should look dark after a few miles of driving. Dark oil means a clean engine, just as dirty water means clean hands.

But here's the catch: the ordinary oil filter pack made of absorbent material soaks up these valuable additives like a blotter. The more additives your oil filter soaks up, the "cleaner" your oil looks—and the more carbon, gum and varnish you may have forming in your engine.

Shocking? Yes, but that's only part of the story. Oil companies have developed still other additives—such as barium and molybdenum—which may make an engine overhaul something you don't even start thinking about

a four page report
on the most important
lubrication discovery
in a lifetime!

until 250,00 miles or so. But there was no point in putting these oils on the market until an oil filter could be developed that would not remove additives. True, a few of these additives are already on the market in limited quantities—but, again, they are ineffective as long as they are being soaked up in absorbent filters.

The problem: find a filter that wouldn't soak up valuable additives, but would remove the microscopic abrasives that do the real damage to precision engine parts. These "danger zone" particles range from 10 to 30 microns in size (a micron is 39 millionths of an inch)—so small that several hundred of them would simply rattle around inside the period at the end of this sentence.

Since conventional absorbent filter material couldn't be packed tight enough to stop these tiny particles without reducing oil flow, engineers decided an entirely new kind of filter material had to be developed. Obviously, it had to be metal—but there was no way of making a metal screen fine enough.

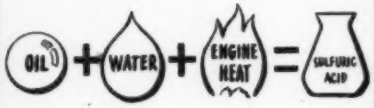
Finally, metallurgists found the answer by fusing together millions of tiny bronze balls into a porous filter. Being non-absorbent, it wouldn't remove additives, yet abrasives simply couldn't get through the spaces between the tiny bronze balls. And, since bronze just doesn't wear out, it would *never have to be replaced!*

Tests Prove Life-time Filter Adds Years to Engine Life

Samples were rushed to government proving centers for testing. Results: the Life-time bronze filter not only solved the critical problem of filtering liquid oxygen, nitrogen, etc., for guided missiles, but could save the government millions of dollars now spent on filter replacement packs for trucks, jeeps, tanks and other vehicles.

Moreover, because the Life-time filter did not soak up oil additives, engine life could be greatly increased.

Besides government tests, millions of miles of road tests in truck, taxi and car rental fleets reveal amazing results. Cars equipped with the Life-time filter have already passed the 300,000-mile mark *without ever changing oil filters!*



By removing water from the oil, the Life-time filter prevents formation of sulfuric acid, deadly enemy of bearings, other precision engine parts.

Micrographs Reveal How Ordinary Filters Let Abrasives Get Through

1 2 3

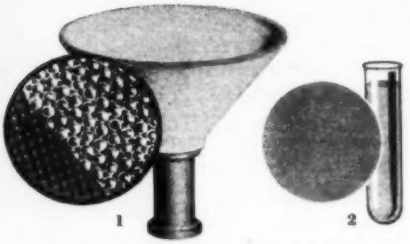
1. After 200 miles, unfiltered oil looks like this. Dark color is normal; it means detergent additives are keeping your engine clean. But abrasive particles are dangerous, should be filtered out.

2. Ordinary filters soak up additives, but let some abrasive particles get through when pressure forces "channels" in pack.

3. Because additives are removed, oil may look "clean" because carbon and gum is deposited in engine. Dangerous abrasives are still in oil.

250,000 MILES before a major overhaul should be normal with today's engines and oils. Only the Life-time filter meets modern requirements.

DIESEL AND GASOLINE truck fleets have proved value of Life-time bronze oil filter in hundreds of thousands of miles of road tests.



1. Since porous bronze can't "channel," abrasives can't get through—but valuable additives can, because Life-time filter is non-absorbent.

2. After 2,000 miles—or 10,000—oil is free of abrasives, but dark, proving engine is clean.

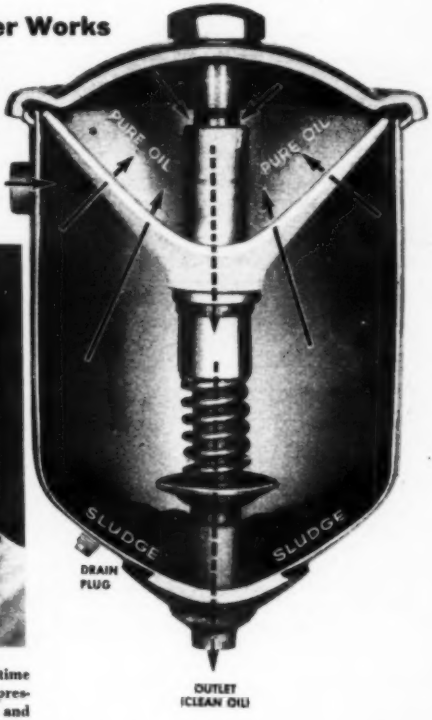
Life-time Oil Filter Never Wears Out-eliminates filter pack replacement forever!

You never change the Life-time filter—just rinse it occasionally in gasoline and it's good as new. In addition, you save the quart of oil soaked up and thrown away regularly with ordinary replacement filter packs, which can add up to a lot of oil during the life of this filter. How long is that? Well, the Life-time filter is guaranteed for 10 years.

But since bronze simply never wears out, the amount of money you save on the filter packs you don't have to buy, plus what you save in engine overhauls, is something for your life insurance man to figure out for you.

How The *LIFE*-TIME Filter Works

As dirty oil is forced through element, all harmful particles drop to bottom of filter case. Only pure, filtered oil can get back into circulation.



"SMOKE TEST" proves superiority of Life-time porous bronze filter. Ordinary filters cause oil pressure to drop when fibers soak up oil, expand and prevent free circulation.

How to Get a Life-time Filter for 2 Weeks Trial in Your Car or Truck

You can try a Life-time filter in your car for two weeks to see if it's really all we say it is (it is, and more). If, however, you decide you don't want to keep it because you miss the fun of buying filter packs, or for any reason, all you do is send it back for a refund, with no questions asked. Ordering is simple:

1. If your car already has an oil filter, you can convert it to a Life-time filter with a kit which replaces your throwaway pack with permanent bronze. Just send us the make and number of your present filter pack (if you know it); otherwise, send us the make, model and year of your car or truck. Enclose $6.95 (we pay shipping) or send $2.00 deposit (you pay balance and C.O.D. charges on arrival).

2. If your car has no filter now, or you want to replace the one you have, send us the make and model of your car and $12.95 (we pay shipping) or $5 deposit, balance C.O.D.

3. A few cars have full-flow filter systems; Life-time filter conversion kits for these are $13.95.

EASY TO INSTALL

If your car already has an oil filter, you can install a Life-Time permanent bronze element as easily as changing throwaway filter packs. You can put a complete Life-Time filter unit on any car or truck in less time than it takes to change a tire; no special tools are needed.

Use the order form below for immediate delivery – and do it today, before you waste another cent on filter pack replacements!

Permanent Filter Division, Dept. FRC-9
Continental Manufacturing Corp.
Washington Blvd. at Motor Ave.,
Culver City, California

Rush Life-time filter for:

Make, model, year of car_____

Present filter make and model (if known)

I enclose

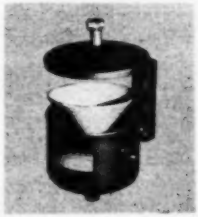
- ☐ $6.95 for conversion kit (full flow, $13.95); factory pays shipping.
  - ☐ $2.00 deposit for conversion kit; send C.O.D.
- ☐ $12.95 for complete unit ($18.95 for chrome); factory pays shipping.
  - ☐ $5.00 deposit for complete unit; send C.O.D.

Name_____

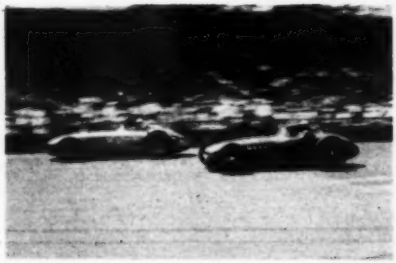
Address_____

City_____ Zone____ State_____

1. Conversion Kit replaces present filter element with Life-time bronze.



2. Complete Unit, which replaces entire old filter, is easily installed.



INDIANAPOLIS "500", Panamerican Road Race, other international sports events are sponsored on network radio and TV broadcasts by Continental Manufacturing for Life-time filter.

Opportunities Now for Life-time Filter Dealers and Distributors

A dealer and distributor network is now being formed to handle demand generated by 4-page reports like this published in leading national magazines, plus sponsorship of radio and television broadcasts of the Indianapolis 500 and the Panamerican Road Race.

These valuable dealer and distributor franchises are not being sold; they are being awarded on the basis of ability to grow with us in the most ambitious expansion program in the industry.

For complete information on how you can be first with the most exciting automotive product of this decade, write or wire:

Continental Manufacturing Corporation
Dept. FRC-9, Washington Blvd. & Motor Ave.
Culver City, California

editorial

HAS THE LAND SPEED RECORD FALLEN?
OR
WHO PUT THE SKIDS UNDER JOHN COBB'S TITLE

You will probably recall Lt. Col. Stapp's run on the Air Force's rocket sled last June. The location was Alamogordo, New Mexico, and the occasion marked man's first venture into the over-400-mile bracket, on land, since the late John Cobb's one way run of 403 mph in 1947.

Does the 421 mile mark, set on the rocket powered, rail riding sled, now stand as a Land Speed Record? It does if you wish to take the title literally. Not being officially recognized as such, the Land Speed Record is a more or less honorary title bestowed upon the holder of the world's fastest land-attained speed mark, regardless of vehicle class and with but one timed run only being necessary. Heretofore, it was generally believed that the vehicle (notice the word *vehicle* rather than *automobile)* attaining top honors in the realm of speed should have wheels at least. Apparently not! Being absolutely literal, it is not incorrect to assume that man does not have to ride in the fastest vehicle in order for that vehicle to be titled Holder of the Land Speed Record. If the vehicle need not have wheels, why should a human have to ride in it? Why not indeed!

Couldn't someone construct a car – say 2 inches long – and send it through a vacuum tube propelled by a sudden blast of highly compressed air? Could the builder then not lay claim to owning the top speed record holder if said vehicle covered a measured distance in excess of the Air Force's 421 mile per hour mark? Why not design a missile – maybe several feet long – and propel it by rocket or jet power and guide it by a taut cable strung high in the air.

(Continued on page 66)

Correspondence

HASSLE, HASSLE

In reference to Bill Black's letter in the June issue of ROD & CUSTOM.

True, the East is plagued with bad weather and the speed shops are few and far between. However, for the most part, Mr. Black seems to have the "Eastern" attitude.

Having traveled the U. S. extensively, I've noted that the overwhelming majority of restyled cars in the Mid West, South and East are strictly gook jobs, running from the mild to the extreme classifications. The West Coast squirrels are, almost without exception, immigrants from out of state.

Appealing originality in restyling is almost non-existant among Eastern enthusiasts. Each issue of R & C is eagerly awaited. It's so easy to follow your How-to-do-it articles and apply Calif. ideas to their cars – then exclaim, "I built it myself!" Real originality? *Phooey!*

Westerners often laugh out loud at Eastern cars – but no complaints. But witness the long line of gripes always coming out of the East.

So, let's face it, Dad. The "Tin Kings" were the first, and still are, leaders in the field. From all appearances this situation won't soon be changed!

Tom Powell — Orange, Calif.

• *Ho-hum. Here we go again. You didn't mention anything about speed or racing, Tom. Have you forgotten that a California horse won the Kentucky Derby?*

HUBCAP TROUBLE

In your June '54 issue, the Barris Korner discussed "Cadillac Hubcap Conversion." The article states that '53 Cadillac hubcaps could be made to mount almost any make of wheel, but specifically it was shown how they were adapted to 15" Chevrolet wheels. Taking your advice, and presuming they could be mounted to my '49 Chevrolet, I purchased two Cadillac hubcaps and two 15" beauty rings. I followed the steps to the letter, but when it came time to mount the discs on my car I found that they would not fit due to the ends of the spindles contacting the center of the hubcaps before the beauty rings even touched the wheels. Mounting, therefore, was impossible – even with the axle nut dust covers removed.

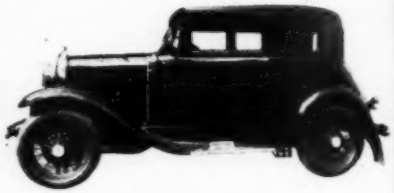
I have spent $12.00 toward this conversion and do not wish to throw my money away. I don't think it fair for you, or the Barris Kustom Shop, to suggest specific alterations for the readers unless they are possible. If any special modifications are necessary, why weren't they included in the feature?

Can you do anything to rectify this situation before anyone else throws their hard earned money away?

Burton Pierce — Arcadia, Calif.

• *The outlay of $12.00 for two Cadillac hubcaps and beauty rings immediately*

brings up this point. The article stated that '53 CADILLAC hubcaps can be adapted (which they CAN) to fit 15" Chevrolet wheels. The article DID NOT state that CADILLAC-TYPE hubs could be used which is apparently what you have purchased. True Cadillac hubcaps cost much more than the amount you have indicated.



ATTENTION MODEL A OWNERS

I was very pleased to see a photo in one of your recent issues of a Model A Ford being restored. The particular car is the property of Mr. Russell Gerrits who is a member of our Model A Restorers Club of which I am the founder and president.

The object of our organization is to preserve and restore the Model A Ford and to be of service to its members by being a medium of exchange for parts, information and ideas. The latter was rather simple at first but with our Canadian neighbors catching on it is getting a bit complicated and to make things even more difficult, we are now being swamped with letters from both England and France.

I am enclosing a photo of my Victoria which at one time, some two years ago, looked as Mr. Gerrit's car does in your photograph.

Keep up the good work on R & C, it has the interest of every auto enthusiast in its pages.

William E. Hall, Pres. Model A Restorers Club Inc., 71 Lexington Rd., West Hartford, Connecticut.

• *Anyone interested in the preservation of Ford's fine Model A may contact Mr. Hall at the above address.*

Indiana street roadster wins first place at auto show.

JERRY McKENZIE wanted a T roadster body so badly that it got to the point he was losing sleep at night. Now, one might think that the fair state of Indiana would be literally loaded with T's and parts therefrom. *Oh, yeah?* Jerry combed junkyards, scrap heaps, barns, woodsheds and scrap steel collecting depots. He called on farmers, antique collectors, business men and he answered, and placed, ads, ads and more ads. As a matter of fact, he even tried the yellow pages in his phone book! Nothing!

O.K. So he tried Ohio – nothing! Illinois – nothing! Kentucky, West Virginia – still nothing! Not even the Ford Motor Company could help him.

In desperation, Jerry even considered hammering one out of sheet metal!

Jerry lives in the heart of Indianapolis. One fine day, as he was driving to work – the same route that he had been taking for several years – Jerry happened to notice the unmistakable, high windshield frame of a Model T jutting far above the other cars in a wrecking yard. Without stopping to wonder how long the car had been there without his seeing it, Jerry managed to negotiate the yard's driveway (not even slowing down) without hitting anything and began yelling at the top of his lungs for the manager.

To make a short story even shorter, the man sold the T to a trembling Jerry who *drove the car home!* His find was a '27 roadster pickup, in *good* running condition. The bill? $50.00 – not bad. A small price to pay to relieve the state of frenzy into which Jerry had managed to work himself.

Thus ended a hunt that had been feverishly continuing over two years.

Strangely enough, Jerry wasn't completely happy with his find. No, it wasn't

Photos by Spence

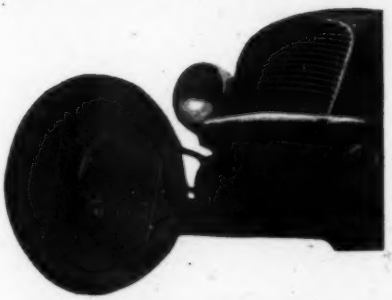
due to the rusted out body sections or the dinged and dented doors. After having wanted a roadster for so long, the thought of having a pickup made him a little sad. As you all undoubtedly know, the bucket, or seating portion of the body is the same for the two styles. Appearance ceases with the addition of either a tail section or a pickup bed. A second search, then, was launched for a roadster tail, Jerry eventually found several '26 and '27 tails but he wanted the older style, the smaller rear end.

Indiana – nothing! Ohio – nothing! It was the same story once again. Finally Jerry reached the same state of desperation that he had just prior to his finding of the T itself. Hammer one out of sheet metal!

Thus we have here a T-bodied street roadster boasting a tail section made primarily from turret top sections of a '39 Dodge panel truck.

To begin paraphrasing the parts, and the modifications of same, that went into this car would be a project resulting only in wasted space, yards of relatively unimportant information and confusion. Thus, following is a part by part listing of the specifications concerning the engine, the chassis and the body. In this manner, it is hoped, the reader can more easily understand the alterations and work that took place during the year and a half of construction of this, the hot rod classification winner of the Fifth Annual Indianapolis Custom Auto Show held during the week immediately preceding the famed "500" mile auto race.

And before we are deluged with tons of mail from sharp-eyed readers, let it be noted that the car was not in running condition at the time the photographs were taken since frenzied construction continued right up to show time and a few minor parts are missing. ●



RUNNING GEAR SPECIFICATIONS:

1934 Ford front axle.

1934 Ford front spring and perches.

1932 Ford front radius rods.

1941 Ford rear axle turned over and reversed to place spring ahead of axle. 3.78-1 ratio.

1941 Mercury spindles, brake drums and backing plates.

1939 Ford floor shift transmission.

New driveshaft made of 4.40 chrome moly, 36¼" long, ground between splines.

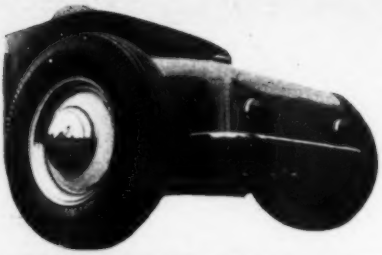
1939 Ford pedal assembly "stretched" 2".

1948 Ford pickup truck master cylinder mounting on bottom of center crossmember.

50-50 Houdaille adjustable shocks, front and rear.

Ross center section steering gear. 6:1 ratio.

All running gear chrome plated except spindles, springs, perches and rear axle housings.



BODY SPECIFICATIONS:

1927 Model T Ford, ¼ ton roadster pickup.

Purchased from junkyard after 2 year search.

Original cost of complete Model T — $50.00.

Hood and side panels hand formed from 16 gauge sheet steel.

Kurtis Kraft hood fasteners.

'37-'38 Miller front-drive race car grille. (Grille purchased for only $8.00.)

Tail section: made from cab roof of '39 Dodge panel truck.

Paint: Indian Ceramic ('49 Kaiser).

Trim: '53 Ford Victoria Sunshine Yellow.

MISCELLANEOUS INFORMATION:

Exhaust system — 2½" tubing, 7 ft. long with removable muffler inserts for "lakes plugs".

Nerfing bars — 1½" chrome moly tubing.

Radiator — Farmal tractor, 3" core.

Wheels — 1941 Mercury.

Tire sizes — 6.00 x 16 front, 7.50 x 16 rear.

Taillights — 1953 Buick.

Windshield — Chopped T with new frames and safety glass.

Gas tank — Pressure tank, hand-formed from 16 gauge steel. Capacity, 10 gallons.

Body work — Bob Metz, Shelbyville, Indiana.

Upholstery — Elmer Ingle — Indianapolis, Ind. Color — naugahyde material, antique ivory.

Body is removable by taking off rear nerfing bar and 8 bolts.

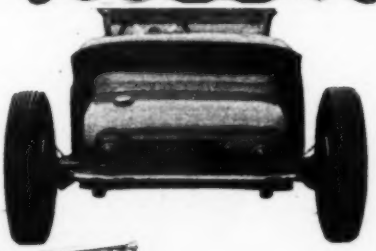
Body shock mounted to frame.

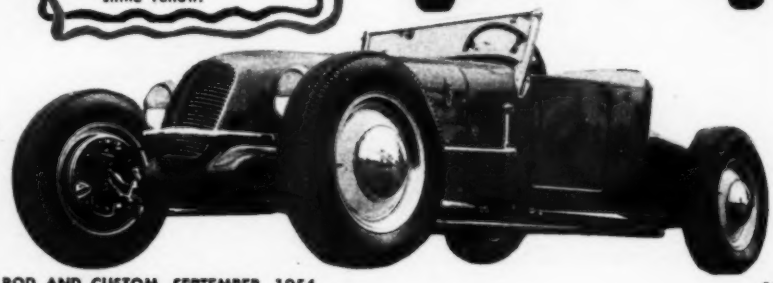
Dry weight of car — 1700 lbs.

Material cost — approximately $1700.

Time in construction — 1½ years.

Featured for first time in Indianapolis Custom Auto Show. First place hot rod class.





ENGINE SPECIFICATIONS:

1951 Ford V8 block.

Bore — 3 5/16".

Stroke — 4".

Iskenderian 1015B "track grind" cam.

Mallory distributor, coil and condenser.

Edmunds 8:1 aluminum heads.

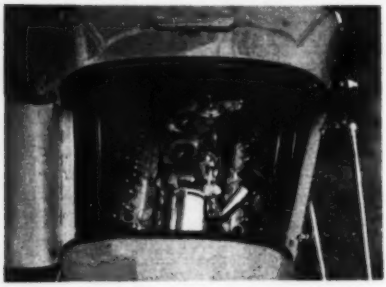
Edelbrock Super dual manifold.

Ford "98" carburetors.

Flywheel lightened to 12 lbs.

Belond "W-type" headers.

All engine accessories chrome plated.



DASHBOARD SPECIFICATIONS:

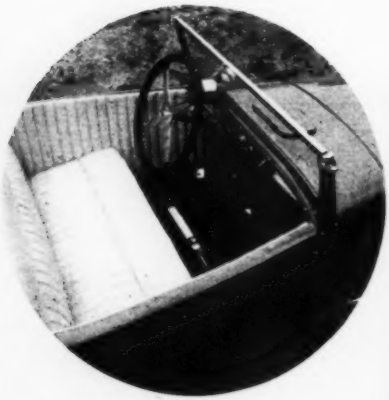
Dash handformed from 3/16" aluminum sheet.

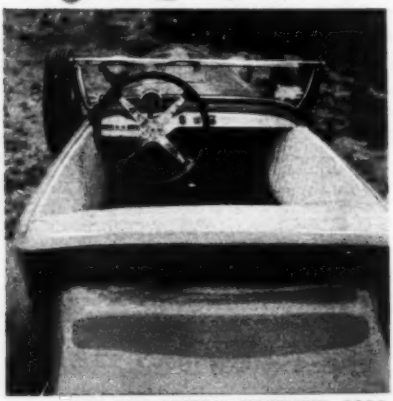
1954 Ford instruments.

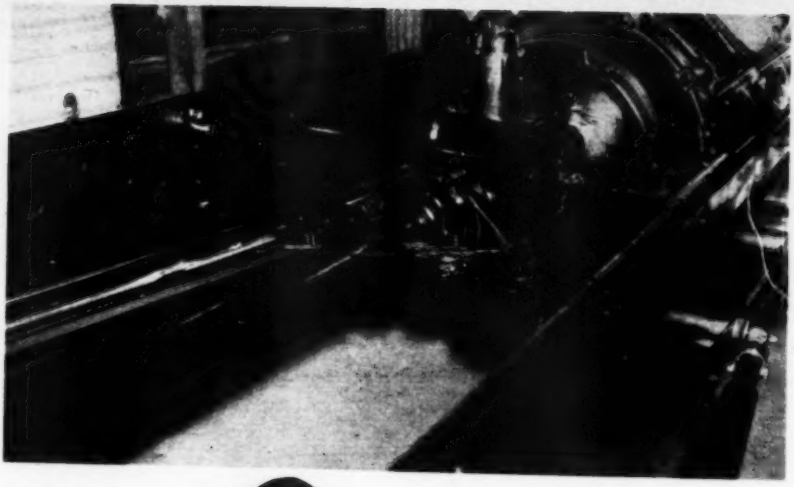
Sun tachometer.

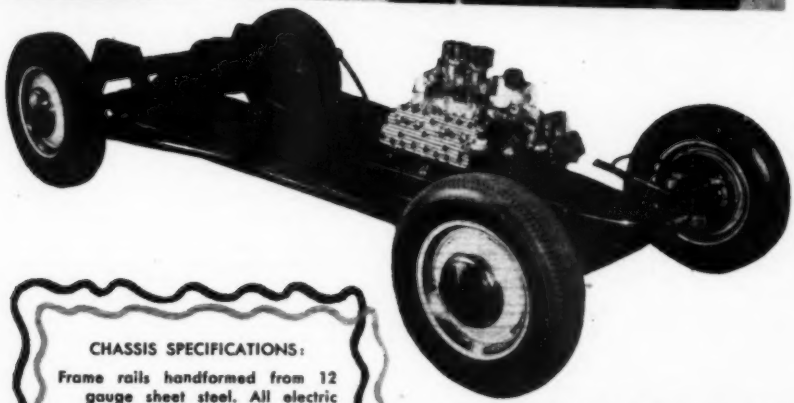
Ignition, light switches: Chevrolet.

Championship racing steering wheel (Bell Auto Parts Co.)









CHASSIS SPECIFICATIONS:

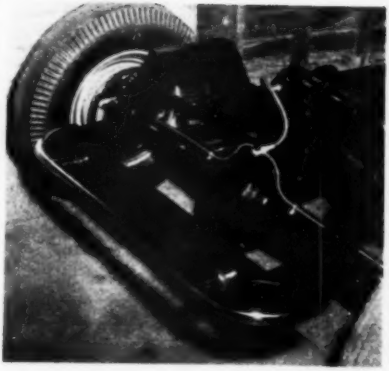
Frame rails handformed from 12 gauge sheet steel. All electric welded inside, hammer acetylene welded outside.

Suicide front and rear suspension.

Removable tube center crossmember.

Frame boxed from center crossmember to rear crossmember with 3" lightening holes in box panels.

8" driveshaft kickup incorporated in the rear crossmember.

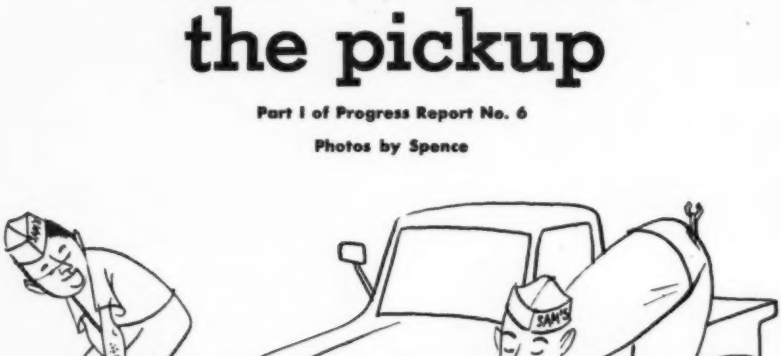


Want to cut your car in half? Don't do it... until you have read this, that is.

SECTIONING the pickup

Part I of Progress Report No. 6

Photos by Spence



SECTIONING! That's the magic word used by customizers and custom enthusiasts the country over to briefly describe the operation involving the removal of a strip of metal from around the waistline of an automobile body. The word itself, according to Webster, means the act of cutting or separating. There's more to it, though, than the word denotes, for once the separation has taken place, rejoining must be accomplished by any one of several methods – none within the reach of the backyard amateur. Unless, of course, the self-made restylist knows just *why*, *how* and *where* to begin and, equally important, how to finish up the project he has cut out for himself. (Pun intended.) To those of you who are desirous of tackling a job as complicated and downright difficult as sectioning, ROD & CUSTOM herewith presents, in the first of two installments, the whys and wherefores of the undertaking.

To begin with, one must make up his mind whether sectioning is the answer to the query of "How can I reduce the overall height of my car – still main-

taining adequate ground clearance – and achieve that *stretched out* look?" The most plausible solution to this problem is to merely take the car to one of the many experienced custom body men throughout the country and ask him to do the job – adding, of course, you'll be back in a little while for the completed car. This is fine, providing there is a large custom shop in your immediate area and you are blessed with enough of that folding green stuff to meet the demands of the customizer. To return to the point, if you have made up your mind that sectioning, and *only* sectioning, is the sole method of meeting your particular requirements, you must decide that: 1, your car will be tied up for a considerable length of time; 2, that you cannot quit in the midst of the job no matter how boring it might become, unless you can afford to discard the first car and buy another one; or, 3, that if the workmanship is not close to perfection little satisfaction will be gained from owning and driving the radically customized automobile.

All right! So you've arranged for transportation while the job is in progress, you've cleared out your entire garage and armed yourself with all the tools of the body working trade. Let's get to work! The first operation on the agenda is the removal, and careful storage, of every conceivable bit of upholstery, trim, glass and wiring that could possibly interfere with the work to be done. Once finished, you will note, probably with great alarm, that the internal structure of the car presents as great, or more of, a problem for the *sectioner* than does the outer skin of the car – the part that shows. Having once determined how much of a section you are going to remove from the car, take a tape measure and a piece of chalk and check, check and recheck every brace, support and housing contained within the area to be affected by the cutting operation. *(For heaven's sake don't cut away too wide a strip from the car just because you want the car to look truly customized when it is finished. One fellow we know of chopped the top on his car to such an extent that he can scarcely see out of it and the job resembles a pie tin resting atop a hat box. He explains that he felt a great amount should be cut from the top as long as he was at it!)*

End view of door illustrates why haphazard or unplanned marking and cutting of panels during sectioning will result only in unnecessary work or loss of entire car body. Bowed panel has to be cut at its widest point so upper and lower halves will properly realign upon rejoining.

Braces must be cut so that when rejoined, all will align as though nothing had happened. Check for clearance between wheel wells and body panels for the wells will, in effect, be raised equal to the amount the car is sectioned. See

if the door windows, and their mechanism, will work as before once the several-inch-wide strip of metal is removed from the doors. Remember, unless you are going to chop your top, the window glass will require the same depth as before but the doors will have become much thinner in proportion. Many similar problems will arise as the hours-long chore of measuring, checking and figuring takes place but with careful forethought, consideration, a lot of common sense and a little luck, the job you have decided upon is well within the realm of possibility and you may proceed.

Take an ice cream cone, remove an inch-wide section horizontally from its center, then put the upper and lower halves back together. What's the matter, don't they fit? Naturally not! The tapering sides of the cone do not permit the portions to realign. The only way in which the cone can be put together again is to completely reshape the segments. Now project this line of thought to the body of your car. Whereas the material used in an ice cream cone cannot be reshaped, the metal skin of your car can – but the work required is too big a price to pay for the result. Therefore, the one and only place to section the various portions of your car is at, or at least as near as possible to, the widest point of each panel. (For unlike the constant-taper ice cream cone, the panels of an automobile body are generally bowed, or have their widest extreme somewhere near their center.) This point is easily determined, providing you have parked your car upon an even surface, by dropping a plumb bob alongside each individual panel and marking the point where the cord touches the body. (See photo.) In many

Body man Gates drops plumb line and carefully moves it against door panel so widest part can be accurately determined. Point of contact will be midway between section line, five inches apart. Important at this stage is level park area for car to eliminate possible inaccuracy.

cases the widest part of, say, a door panel will be at one elevation toward the rear of the door while the forward end will have its widest point at either a higher or lower elevation. Therefore, on panels over two feet long, check two or more points of the panel and join them with a straight line. Should the center mark of any three points be slightly above or below a straight line joining the outermost points, don't worry. A little reshaping is bound to be necessary but if you attempt to section your car's panels along curved lines you will run into much more work than you bargained for. The point of the matter is, always section along a straight line. If a jog is necessary, make the cuts, regardless of direction, as straight as possible.

Now, if you have decided to remove five inches from your car's middle, you must scribe two lines around the body — one, two and a half inches above the original line denoting the widest point of each panel, and another line the same distance below.

Wait! Don't start cutting along the lines until you have rechecked the internal body structure to see if metal removed from the areas marked will interfere with the replacement of any of the imperative body components. All clear? O.K. *Cut!*

There's more than one way to skin a cat, as the saying goes, and there are an equal number of ways to slice apart an automobile. Torch, tin snips, channel cutter or with a hand-, or air-, operated chisel. The air chisel is your best bet since it will accurately follow a line and keep panel distortion at a minimum, however few home shops are so equipped and only a handful of rental establishments have one to offer. The torch should be the *last* alternative since the heat will cause the panels to buckle needlessly resulting in tedious, unnecessary reshaping. However, it has been used on several of the many sectioned cars featured in past issues of R & C with no noticeable effects.

Widest points of door at either end are equal distance up from base so cut line is horizontal. Lines have been scribed across panel and through end frame. Chalked area indicates the portion to be removed with air chisel, the ends are to be later eliminated with a hack saw.

Removal of panel section reveals internal parts including window stop, center, and glass channel, right. Careful note was made before cutting so items would not be damaged while severing. Slightly uneven line of chisel cut was finished off with grinder to insure close fit of halves.

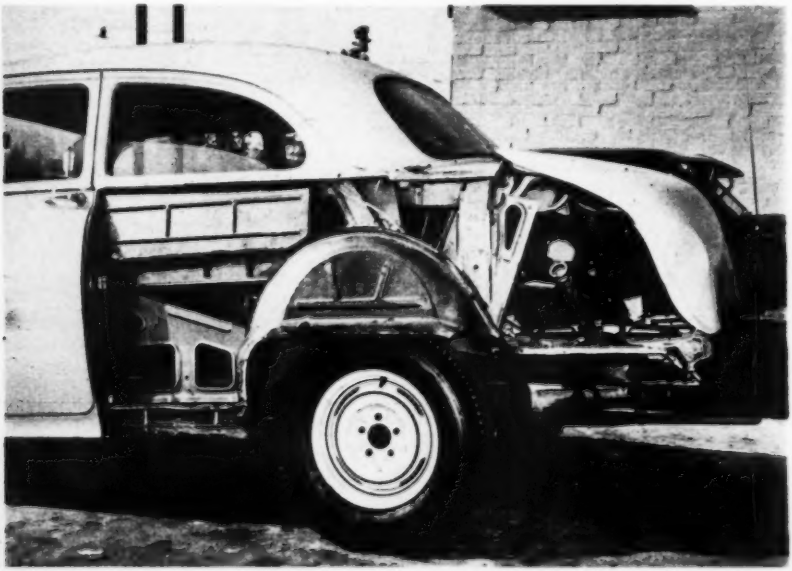
The torch, if nothing else is available, should be used swiftly to prevent the heat from passing into areas of each panel not to be effected. Too, the cut should be made well inside the marked lines and the cut brought out to proper width with a hand grinder.

ROD & CUSTOM's rolling laboratory was used in the case illustrated and to provide the reader with understandable step-by-step photographs of the work as it progressed. Naturally, our truck cab does not include nearly as many problems as would a passenger car, but it is felt that once armed with a working example, a little common sense on the part of the reader can be used to project our problems to meet his own.

Sam Gates, the lad who chopped the pickup's lid and, it might be added, rejoined the pieces and finished the job without the use of lead (R & C, May and June, '54), was chosen to do the dirty work. The cab, already stripped of its internal trim, was delivered to him and he, after thoroughly checking the items mentioned earlier, marked the body in accordance with the plan outlined above. The panel lines were extended to include such vertical bracing as the forward and rear door posts and the cowl side braces.

Sam's air chisel cut cleanly and evenly along the proper course but instead of continuing each cut through to the door posts, the panel sections only were re-

This photo will probably scare a good many sectioning enthusiasts right out of their wits! It is a '53 Chevrolet with the outer quarter panel skin removed thus laying bare the essential structure, typical of most late model passenger cars. This is the part of a sectioning project that causes the most difficulty – not the outer shell which is all the observer can see. R. & C's truck, fortunately, is not built in this manner so a tremendous amount of work was sidestepped by choosing the pickup body. However, most of our problems, discussed in the text, can be extended to meet the requirements of the average passenger car. Car in photo was damaged hence panel removal.



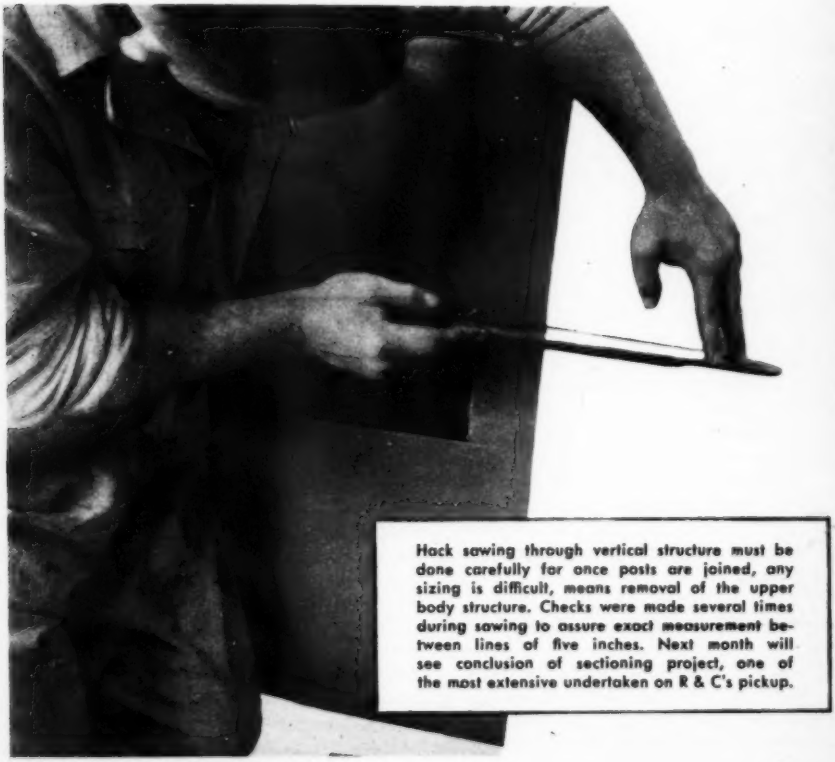
moved leaving the door posts to hold the upper and lower portions of the body intact. (The posts will be cut later with a hacksaw.) In one or two minor instance the chisel had crept inside the marks so the hand grinder was fired up and used to take the cuts to the proper dimensions. (Had this phase been left until *after* the body portions had been brought together, the job would have been doubly difficult.)

Work progressed slowly but steadily, any mistakes during the cutting operation would have been catastrophic and it is not unreasonable to predict that had the plumb bob part of the project been incorrectly completed, the body would surely have been left out in the alley for the junk man to haul away at his earliest convenience.

Slowly but surely! That was the motto of the day – or days, as it turned out.

This brings us up to the midway point in this two-part, "How-to-do-it" feature. Next month's issue will describe the rejoining of the braces, the outer skin and the finished metal work on the areas exposed. The whole firewall, it might be added, was removed since it will be replaced with one specially constructed to fit the big Olds V8 engine.

If you're eager to start sectioning a perfectly good car, go to it – we'll catch up with you next month and show you the ins and outs of finishing up the job preparatory to painting. ●



Hack sawing through vertical structure must be done carefully for once posts are joined, any sizing is difficult, means removal of the upper body structure. Checks were made several times during sawing to assure exact measurement between lines of five inches. Next month will see conclusion of sectioning project, one of the most extensive undertaken on R & C's pickup.

IN THE past few years, since the introduction of many new ohv engines, an endless stream of accessories has been placed on the market. Accessories designed for use on the new V8's. One of the recent additions to this line is lightened, or magnesium rocker arms. When these new products first appeared a lot of enthusiasts possessing a car powered by one of the engines for which they were intended grabbed them up and hastily installed said rockers forthwith. The result was, more often than not, unsatisfactory installation.

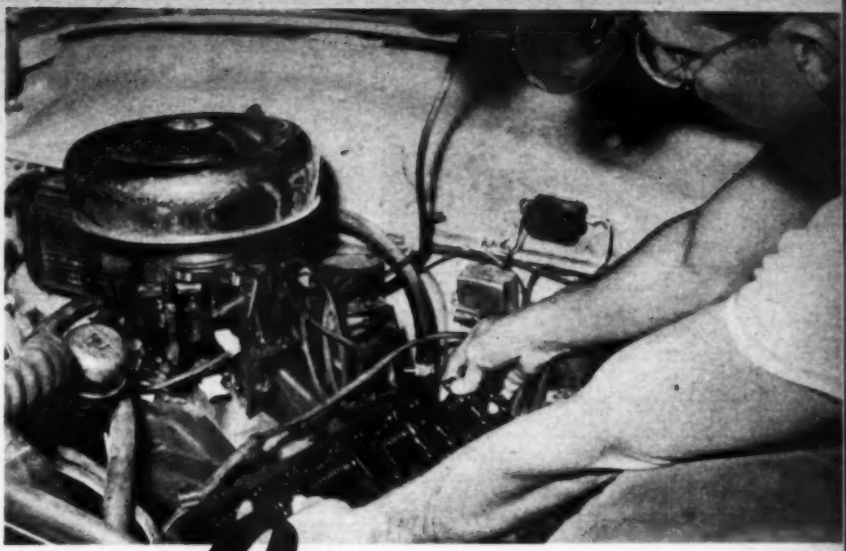
Were these new items inferior? No, they were not! By carefully screening the results and the damaged products it was ultimately discovered that about 99% of the complaints were due to, specifically, snafu-type of installations and, in general, misunderstanding of instructions. Upon corresponding with a few of the unhappy purchasers of these rocker arms it was found out that they had done the installation to the best of their abilities and interpretation of the instructions. It all boiled down to a simple fact: The installation of magnesium rocker arms, and the addition of solid valve lifters, would necessitate the inclusion of a complete handbook with each kit sold. However, each and every speed equipment manufacturer cannot include a complete "How-to-do-it" book with every accessory sold. The manufacturer is correct in assuming that the purchaser would not attempt an installation job at home unless he knew what he was doing to begin with. The recent craze over the do-it-yourself type of thing is a concerted attempt to dodge usual high labor charges. If an enthusiast were to bounce into a garage every time he bought a new accessory, that person would end up with far less equipment for his money than would the individual who did his own work.

When undertaking the installation of any and all equipment on your car, *be sure* you know *what*, *why* and *how* to do the operation involved before you pick up a single tool! Moredver, check every detail in disassembling all parts just to make sure you can put them back together the way they came apart.

Following is an installation of magnesium rocker arms showing, also, the collapsing of hydraulic valve lifters. Parts for doing the complete job are included with most kits presently on the market. It can be truthfully said that this installation is the easiest of all engine conversions with which to become confused. We hope to enlighten you on some of the operations and we also trust you will have a smooth installation and that in doing so you will proceed in the direction of becoming a smooth workman.

Collapsing '49-'53 Cadillac Hydraulic Valve Lifters

The kit used for the illustrations in this article is that manufactured and sold by Howard's Racing Cams, 10122 S. Main Street, Los Angeles 3, Calif. The magnesium rocker arms alone may be installed or the solid valve lifters can be added at the same time. Taking for granted that both of these features are to be utilized, the first step is to remove the intake manifold. Next, off must come the valley cover – that pan located just below the intake setup. Now the cam followers and tappets or hydraulic lifters, which ever you prefer, are exposed. Now then, take off both the rocker arm covers, after removing the spark plug wires. On the later engines the covers themselves are retained by four screws. With the rocker arms and stands now accessible, back out the bolts holding the rocker assembly and lift it off carefully. With both assemblies, including arms, stands and screws, removed, the push rods can be lifted directly out. These do not have to be kept in order since all sixteen of them are identical. There is a top and a bottom to these rods, though, as may be determined by noticing the machined recess that comes in contact with the rocker arms. If the pushrods do not release from installed position, rotate



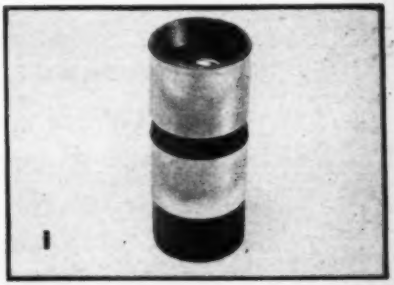
ACCESSORY *Installation*

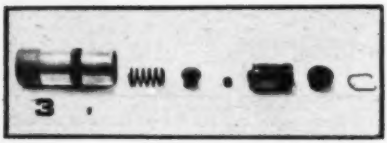
Installing magnesium rocker arms —the right way.

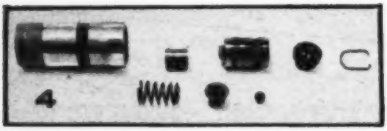
By Moon Automotive

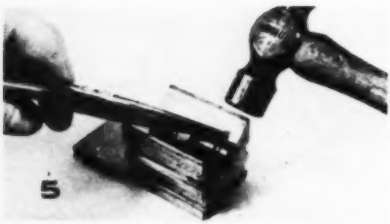
them between the fingers at the same time exerting an upward pull. With the push rods removed, the hydraulic lifters themselves can be taken from their respective holes.

The lifters (Photo #1) are removed as individual units. If some are reluctant about easy removal, a pair of beetle-nose pliers will provide the necessary convincing. If still no luck, special tools are provided for doing the job at the nearest Cadillac agency.









With the lifters removed, take out the cup retaining clip ring (Photo #2) with the beetle nose pliers. The push rod cup will now drop from its position.

The next item slated for removal is the piston of the lifter. (Photo #3). At times this can be a very disconcerting step. By soaking in cleaning solvent and tapping downward on a solid object, the piston will generally give up and fall out. Following closely behind is the steel ball, the retainer cup for same and a spring.

The steel ball, the retainer cup and the spring are not to be replaced (Photo #4) so set these aside. In their place install the 7/16" tubular spacer furnished with the kit. (If the heads have been, or are to be, milled, cut an equal amount from the steel inserted tubing. (*Do not* use flat steel spacers between the heads and the rocker arm stands.)

Place the lifter piston (Photo #5) in a V block and tap the aluminum rivet, supplied with the kit, partially into the small hole. Cut off the head of the rivet with a pair of diagonals (Photo #6), then drive remaining portion further into hole with drift punch so the tip of it clears the side of the piston. (Photo #7). The piston is reinstalled directly on top of the newly added spacer. Next to go in is the original push rod cup and, finally, the original retainer ring. With all of the lifters converted, they may now be reinserted into their original locations. (Note: the rivets placed into the holes in the sides of the pistons are to retain engine oil pressure.)

With the lifters installed, the push rods (stock) may be inserted through the openings in the cylinder heads from which they were removed – making sure the proper ends are facing upward. The chamber, or valley, cover can now be replaced. The intake manifold follows.

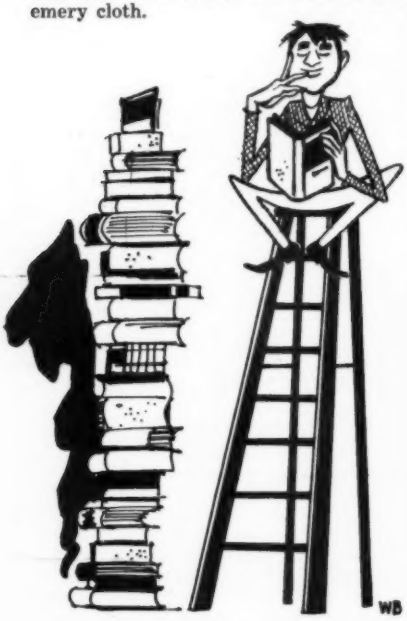
This completes the conversion of the hydraulic lifters to non-hydraulic operation. From this point the installation of the magnesium rocker arms is the same regardless of whether the lifters were changed or not.

Installing Magnesium Rocker Arms

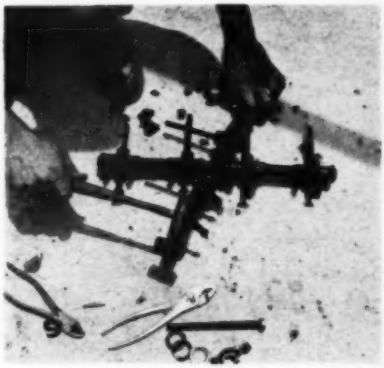
Remove the cotter keys to be found in both ends of the rocker arm shafts. (Photo #8.) The cylinder head cap screws that retain the rocker assemblies can also be removed at this time.

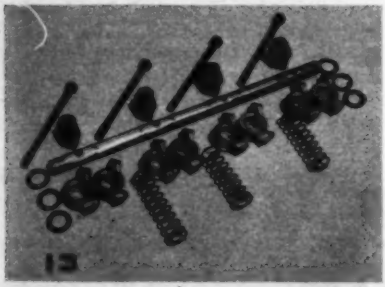
If rocker arms and stands refuse to drop free from their shafts (Photo #9), the use of a plastic mallet may be in order. On earlier model Cadillac engines the two outer rocker arm stands have holes for retaining the rocker arm covers. These must be replaced in the same locations. Later models do not have to go back the way they came apart. This is a very good point to remember – that of taking mental note of the disassembly procedure.

Inspect the rocker shafts at this time for galls. Remove carbon and sludge deposits (Photo #10) with a coarse grit emery cloth.



When undertaking the installation of any equipment be sure you know what, why and how to do the operation before you pick up a single tool! And don't forget it.





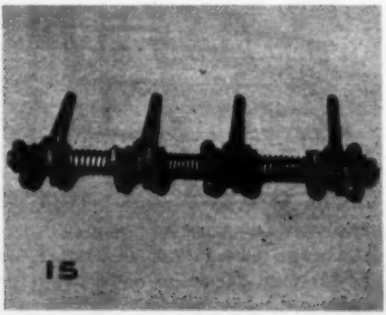
Rocker arms require specified lubrication so the oil passages in the center of the rocker arm should be cleaned of any possible sludge with a fairly stiff length of wire (Photo #11). Flush thoroughly with cleaning solvent and blow clean with compressed air.

Howard magnesium rocker arm (Photo #12) looks stronger, larger and heavier than the stock Cadillac arm, right. The weight of the magnesium rocker, though, is about one half that of the stock item. The strength of the two are equal.

Magnesium rocker arms are available with stock lift, 1.5-1 ratio, or high lift, 1.8-1 ratio. The high lifts open the valves an additional .070" over the stock rockers. Rocker arm in photo is termed a high-lift.

The component parts (Photo #13) for one bank of cylinders are shown ready for assembly. Notice that the shorter length spring is in the center. Helical slices in top of rocker arm shafts are oil slits for the valve stem ends of the rockers. These (the slits) face upward. Small holdes visible in side of shaft facing arms goes toward push rod end of rocker. This procedure holds true for both cylinder banks.

Lubricate shaft liberally prior to installation of rockers, stands, etc. (Photo #14). You will notice a small slot on each extreme end of the rocker arm shafts. These are locating notches. Looking at the front of the engine, or the fore end of the rocker shafts, the



notches should be facing each other (toward the center of the engine). Visually checking this will prevent you from installing the shafts upside down.

Prior to installing the rocker arm assemblies, back out, or loosen, the adjustment screws. If this is not done, the springs may bottom themselves and either bend the push rods, break the rocker arms, or both (Photo #15).

(Photo #16.) Tighten the four hold-down screws evenly after making sure all the push rod ends are engaged with the rocker arm ends. With the four bolts in place, torque *all* the head studs, including the ones just installed, to stock specifications.

Preliminary and Final Settings

Firing order for '49 to '54 Cadillac ohv engines is as follows: 1-8-4-3-6-5-7-2. The left bank of cylinders are those with the odd numbers, 1-3-5-7, working rearward from the front of the engine. Conversely, the right cylinders, from front to rear, are numbered evenly: 2-4-6-8.

Remove the spark plug from #1 cylinder, first cylinder on left bank. Hold your finger tightly over the plug hole and slowly edge the engine over, using a jumper wire from the starter, until the timing marks on the vibration damper (front crank pulley) and stationery timing finger are aligned. If the compression attempts to force your finger from the hole then you have #1 cylinder at tdc, top dead center, of compression stroke. If you feel no compression at tdc, then you know that you are exactly 180 degrees off, or the top of the exhausting stroke.

(Continued to page 68)

Neither too gaudy nor too sedate...

Neither too fast nor too slow...

Here's the coupe that's—

"Just Right"

Photos by Spence

BRUCE HALE went out to his garage early one morning to take a close look at the car he had hurriedly bought the day before. What he saw made him wonder whether he had made such a good bargain after all. The '40 Ford coupe had received reasonably good care during its ten years of existence but the 80,000 miles showing on the odometer had taken their toll. The shocks were poor, the brakes were even worse, every bearing and bushing in the engine and chassis had seen far better days and were slated for replacement. The engine, though it would run, belched forth great clouds of smoke from both the exhaust and from the breather pipe. The rattles that showed up whenever either door was closed would take several moments to die down. The fenders, though surprisingly free from dents or rips, were thinned by rust. A car is a car, though, and Bruce made up his mind to make the best of his purchase.

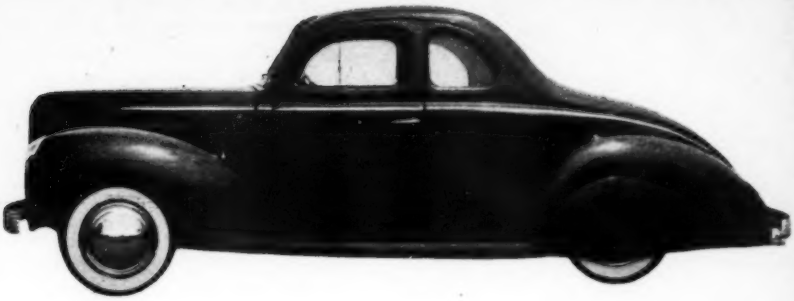
Living in Tennessee made it hard for the enthusiast to get the parts he needed. Most of the special equipment had to come via parcel post and good body men were practically non-existant. Nonetheless, Bruce decided that a little thing like locale wouldn't stop him.

Having arrived at a temporary peace of mind, the next problem concerned the "what to do" phase.

Now, '40 Fords have had every conceivable thing done to them that it is possible to do to an automobile. They have been chopped, channeled, lowered, sectioned, filled, radically restyled, hopped up, raced, gutted and painted every color that the rainbow offers, and then some. To try to outdo every other '40 owner looked like an impossibility so, after much deliberation, Bruce decided to not do anything radical to the car, but to do each little thing better than it had been done before. Better paint, better upholstery – and so on until one could actually become tired thinking about it.

One look at the rusted fenders – the Tennessee weather plays utter havoc with anything metallic – made it obvious that something would have to be done. Repair? No. Replace! Making the rounds of every Ford agency in his own, and neighboring, states, netted a full set of fenders, running boards, inner fender panels and a good percentage of never-used chrome trim, fender welting, taillight gaskets, etc.

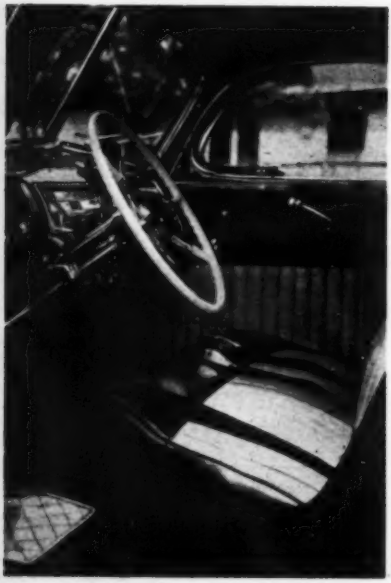
The car was torn apart until it lay scattered around the garage. The walls



Attention to smallest details resulted in a lack of ornamental accessories thus cleaning up styling. Frontal alterations to the '40 Ford consist of filled hood top and shortened side strip, addition of front and rear, ribbed '37 DeSoto bumpers. All of the visible plating has been redone including the grille. The hand rubbed glistening black lacquer paint job is balanced by white side wall tires.

Like front, rear of coupe is protected from damage by early DeSoto bumper. Filled deck lid serves to widen appearance of car. Mild lowering shows forethought and good sense.

Coupe's owner trekked 2,000 miles to Los Angeles to have Runyan upholster interior. Colors are black and antique white cowhide. All removable interior fittings have been chrome plated including steering column. Wheel is late Ford. Notice the safety belts.



of the home workshop were hung with brackets, wheels, fenders – in fact the whole scene resembled a well-supplied parts house – devoted exclusively to the '40 Ford enthusiast!

Initial reworking saw the car disassembled down to the last nut, bolt and frame rivet, but as work progressed the car was in running shape long before it was actually completed. Therefore, it soon became a familiar sight in and around the Memphis area what with its missing hood and its two tone black and primered finish.

Bruce Hale is the type of guy who wants to be on the go whenever possible, so the '40 has seen trips to Daytona Beach during Speed Week, to Bonneville during the time trials, to Indianapolis for the "500" and to Los Angeles for the drags. (Present mileage on the car is 150,000.) During the latter trip, Bruce became so engrossed in the upholstery in a '40 coupe he ran across at one of the West Coast strips that nothing would do but he had to go home with his '40 done with the same fine craftsmanship. Runyan of L.A. was elected to do the job and early one Monday morning the coupe was rolled into the shop and all hands bent to the task. Tuesday night marked the driving of the last upholstery nail and Bruce took off for the South once again – the possessor of a beautiful interior composed of rolled and pleated, black and egg shell white cohide.

'37 DeSoto ribbed bumpers, highly popular in the West until they became unavailable due to the demand, are reasonably plentiful in the South so he unearthed a set, had them chromed and mounted them on the coupe – but quick!

Speaking of chrome plating, *every* nut, bolt, washer and detachable accessory under the filled hood was plated. Aside from the more ordinarily chromed parts are such things as the steering gear, the brake and gas lines, the oil lines, the hood latch, hinges and springs and the small clips that secure the various lines to the firewall, frame or the

inner fender panels.

New inner fender panels were discovered and the unusable holes filled. The panels then were black lacquered. The same treatment was applied to the firewall and to the exposed areas of the frame in the engine compartment.

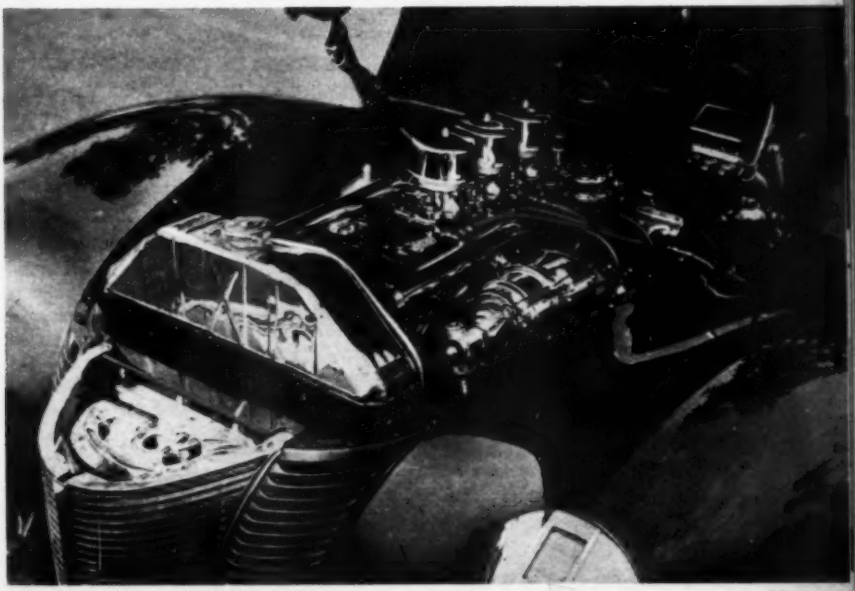
By reversing the rear spring eyes and adding six inch spring shackles, Bruce dropped the rear of the Ford to the level he wanted it. An anti-sway bar was used to prevent side sway due to the longer-than-stock shackles. The front spring is also equipped with long shackles. Aircraft-type shocks are mounted at each corner to help hold the 6.00 x 16 white sidewalls to the ground.

An eight coat black lacquer job, hand rubbed to a lustrous finish, completed the visible portions of the car and the addition of skirts and full moon hubcaps brought the car up to modern styling.

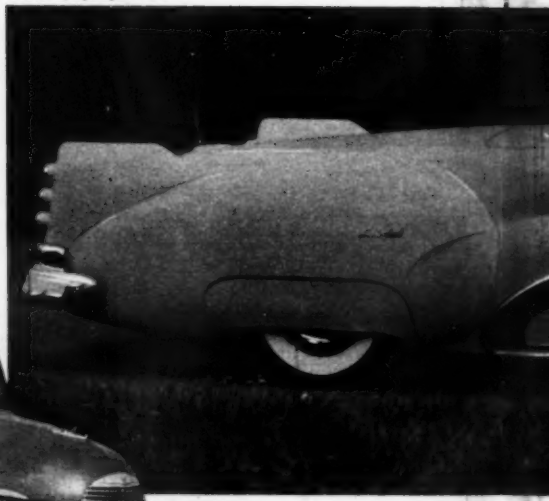
(Continued on page 62)

Reverse side of bumpers have been painted black and supporting brackets chrome plated.

Blinding array of chromed parts greets the observer when hood is raised. Neatness is proved by alignment of screw slots, plating of brake, fuel lines and hood latch plate.

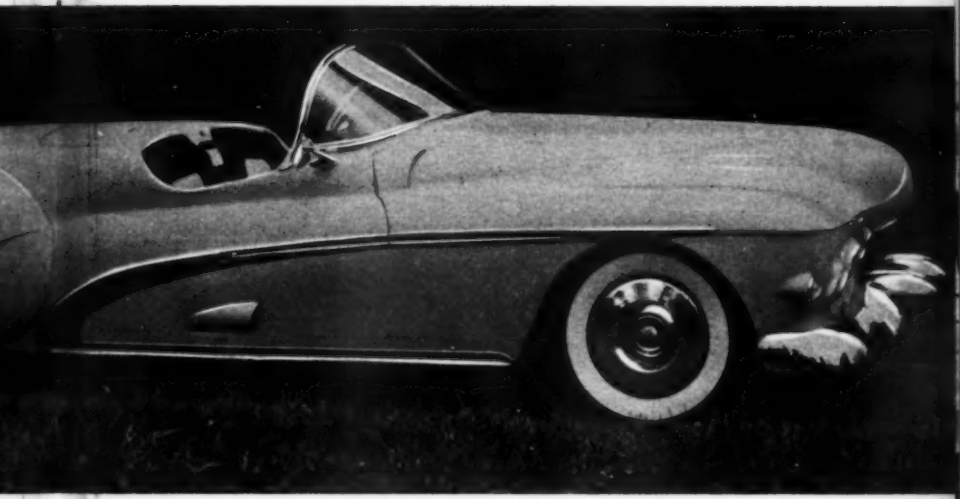


Photos by Spence



LaRocket

Custom Winner of the Indianapolis Auto Show.



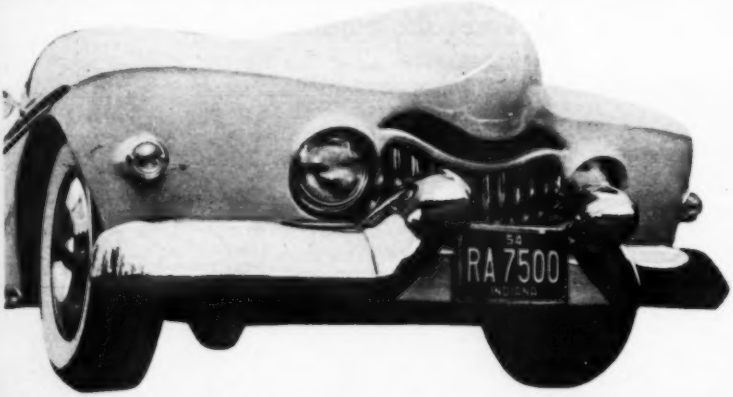
HOW MANY attempts have been made to capture the styling of GM's famed LeSabre? In the years that have passed since its first introduction to an astounded public, custom restylers throughout the country have devoted untiring effort toward duplication of the long, sweeping lines of this, perhaps the most startlingly radical of all experimental-design cars.

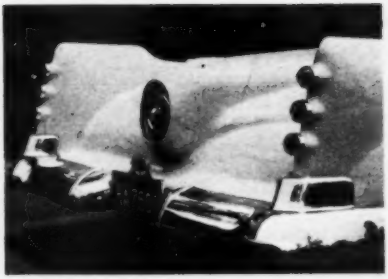
One of customizing's neatest tricks is the modification of production car components into something bearing little resemblance to their original self, thus relieving body men of the tedious work involved in the shaping of flat sheet metal. However, in the case of LeSabre, enthusiasts were at a loss to find any fender panels, hoods or door sections that conformed even remotely to the radical treatment contained in LeSabre. For that reason, few trys at copying the GM car have been successful – most of them resulting in something that bore no relation whatsoever to the prototype.

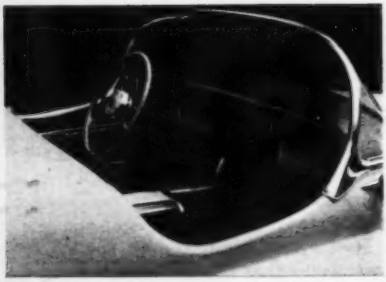
The recent Indianapolis Custom Auto Show proudly displayed, to wide-eyed customers, the neatest assemblage of LeSabre-type lines yet to be created. The car is the proud possession of Bob Metz, from Shelbyville, Indiana, who built the auto over a period of one and a half years – consuming something over 3000 hours of spare time work.

Bob, it should be noted here, is a custom body man (needless to say!), who has built a number of show winning customs and a few widely publicized rods. LaRocket – as his creation is so aptly named – is his own car for Bob finally decided to construct something to suit himself instead of just to please a customer. Based on a LaSalle chassis, LaRocket is powered by an Olds V8 engine, hence the custom's name.

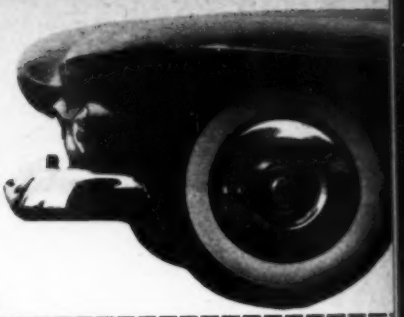
On this and following pages, ROD & CUSTOM is proud to be able to bring its readers the first full coverage of this trophy-catching automobile. Plan on seeing more of this car, for it is slated for appearances at many more auto shows for some time to come. ●



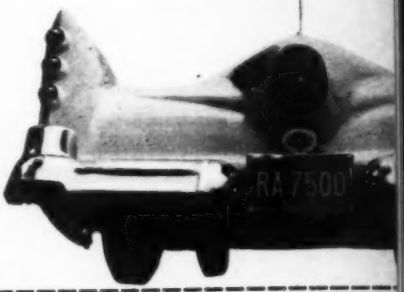




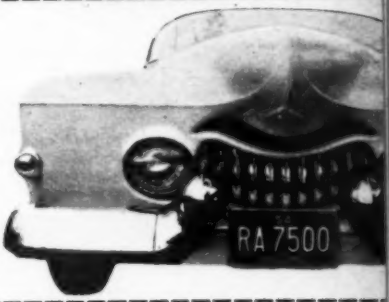
FRONT END of the Rocket combines '41 Olds fenders, sans [illegible]ights, unusual protrusion of hood, Cadill[illegible]r and two LeSabre-like parklights. Ow[illegible]ilar Bob Metz consumed over 3000 hou[illegible] painstaking labor in the creation of t[illegible]ruly "different" custom.



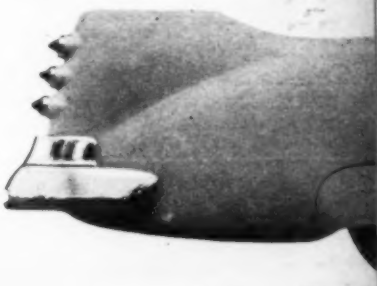
REAR END of the [illegible]a-built car is a far cry from the con[illegible]nal type of auto. Starting with [illegible] Buick rear fenders, high fin-like exter[illegible] added and finally fitted with [illegible] tail and direction lights. LaRocket's co[illegible] Pl[illegible]h San Pedro blue.



HEAD ON v[illegible] faintly resembles an extinct animal of some type. The frontal appearance, difficult to get used to, becomes ultimate in "new look" as one becomes accustomed to it. Hood, like front fenders, was formerly part of '41 Olds. Note lack of hood-fender seam.



TAIL ENSEMBLE is car's closest approach to GM's LeSabre from which it was copied. The center-mounted antenna was answer for debate over its location. Exhaust pipe is hidden beneath swing-out arrangement in center of what was originally the old '39 LaSalle's hood.

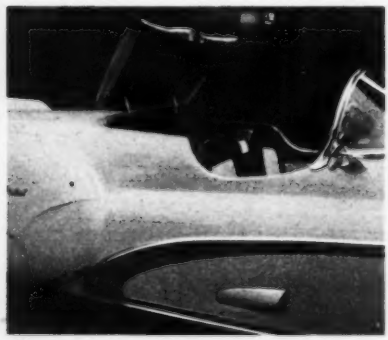


LaRocket, shown here midway in construction, resembled nightmarish conglomeration of non-related components. Endless hours of labor brought sad looking beginning up to the undeniably beautiful car shown on these pages. First place trophy was won at Indiana show.

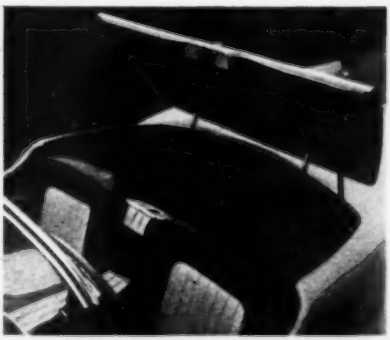
Worm's-eye view of the doorless side panels reveals flawless craftsmanship. Chrome trim is from '53 Buick. Unusually located scoop . . .

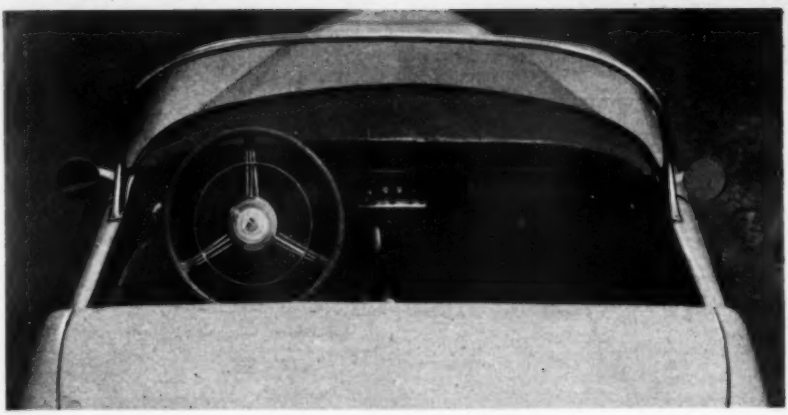
. . . hinges inward providing step for passenger. Scoop is spring loaded so returns to normal position when the entrant removes his foot.

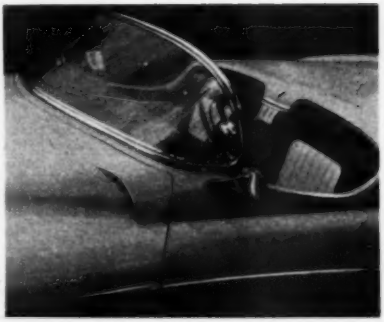
Wrap-around windshield was handformed from sheet Plexi-glass, frame made from tubing. Small deck, opened by button, swings up . . .



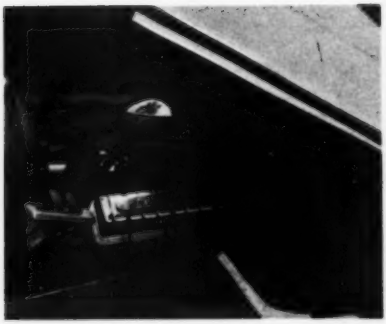
. . . exposing the adequate luggage compartment immediately behind the red and ivory upholstered seats. A removable top will be added.



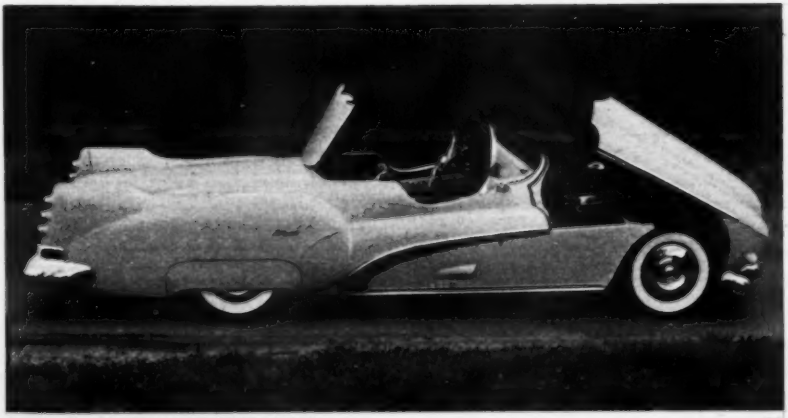




Combination tubing and sheet metal windshield frame comprised hardest part of the whole job. Hood scoop admits air and allows hand hold . . .



. . . so hood can be raised exposing the engine compartment. '51 Olds V8 couples to standard LaSalle transmission with floor shift lever.



building an

exhaust system

by lynn wineland

how to do it part II
dual purpose pipes

Last month ROD & CUSTOM presented its readers with the details of constructing a set of high capacity, scavenging type headers. The set described was being constructed by Doane Spencer of Sun Valley, Calif., for an Olds V8 mounted in a '32 Ford chassis. It was noted that the car was to be used for both street and competition, necessitating an exhaust system which would release the waste gases with the greatest possible efficiency, yet be quiet enough for use on city thoroughfares. The requirements could best be met by constructing a set of blow-out tubes with removable plugs for speed trials which, with the caps secured, would route the exhaust through mufflers for normal operation. Want the details? Read . . .

PART II. DUAL PURPOSE PIPES

INSTALLATION OF bypass exhaust systems will vary with the chassis usage, engine type and location, and the individual desires of the owner. The method presented can be used in many cases very much as described, in others only the basic principles will apply.

The headers described in the preceding article are of the W-type and collect gases from the individual ports in the main trunk which is of 2½ inch diameter. The point of exit from the header is fitted with a four-bolt flange. The exhaust pipe, also 2½ inches in diameter, will be fitted with a similar flange and is to be supported at the front by attachment to the header.

A large radius, 2½ inch tubing U-bend was halved, and a quarter-turn was aligned underneath one of the headers so as to direct the exhaust flow to the rear, parallel with the lower side of the '32 frame rails. A short straight section of the same size tube was tack welded to the bend and continued to follow the line of the frame down to the center crossmember where the rails level out. Another length of the seamless tube was cut to extend from the latter piece to just aft of the rear of the car door. This, too, was tacked on so as to be in line with the lower edge of the frame, presenting a smooth, flowing appearance when viewed from the side. After assuring each piece was in its proper location, the sections were welded together and hammered smooth.

Left blowout tube and cap after chrome plating. The smooth finish on the unit was attained by careful construction, hammer-welding, patient filing. Slope at the forward end is purposely styled so to follow lower line of the '32 Ford frame rails for ultimate in neat appearance.

Kickup from the exhaust pipe to the muffler is located directly behind the center frame crossmember, thus enabling the use of extra-long silencers, mufflers, for peaceful street use.

Business end of the competition part of the exhaust system. Tapped tube supported in pipe accepts wing bolt, holding the cap securely in place. Wing bolt is handmade from discarded Ford parts with a little intuition thrown in. Asbestos gasket causes perfect exhaust seal.

Hammer welding should be performed whenever possible because of the added strength, smooth inside surface and elimination of the need for a lot of filing for neat appearance.

After bolting the unit up to the headers and temporarily supporting the rear of the pipe, a measurement was taken to determine the location and contour of the kickup to the muffler. In order to put the longest muffler possible into the system, the kickup was placed directly behind the center crossmember. It was made of 1¾ inch tubing and formed from half a U-turn so the flow from the capped blow-out tubes would be smooth and efficient.

The mufflers themselves, of a popular brand, pass-through, glass-packed design had brackets welded to the steel tube casing and were bolted directly to the frame rails at two points. With the kickup end inserted into the muffler and clamped, the rear of the exhaust is given sufficient support so that no other clamps or brackets are needed.

The tail pipes vary greatly on different cars and in many cases the stock items or factory-made dual side pipes can be used. On this car it was the owner's desire to have the exhaust exit beneath the runningboards just forward of the rear tubes. Several sections of curved tubing were assembled to route the pipe in the desired position, and a short length of strap attached which supported the end of the tail pipe by mounting to one of the bolts which join the running board and the fender.

The blow-out tube caps can make or break the appearance of the exhaust system. A number of efficient ways of capping the pipes is available. Most common is the flanged end with a flat plate across the tubes and secured by two or more bolts. Also seen is the threaded pipe end which uses a plumbing plug for a cap. On 2½ inch diameter tubing, some enthusiasts have taken the end of a Ford gas filler pipe and affixed it to the end of their exhaust tubes. This allows the use of gas caps for plugs which can be quickly removed with but a half turn.

The method selected by Doane Spencer, while involving more work than any of the foregoing devices, is probably the neatest, most attractive and effective method used.

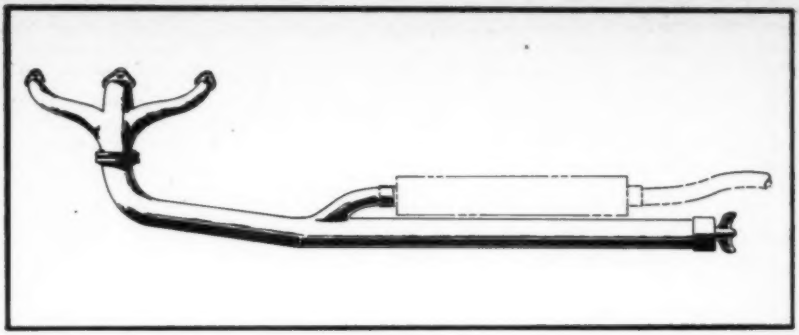
A section of tubing with an inside diameter large enough to slip over the 2½ inch pipes and of about 2 inches in length was plugged at one end with a circular metal plate. The weld was hammered and a radius filed to present a smooth, slightly rounded appearance. A 7/16 inch diameter hole was bored at the center of the plugged end to accept a 7/16 inch Ford engine stud which had been screwed into a Ford spindle stop nut and brazed solid. The ⅛ inch thick ears were welded to the nut and after much filing took the shape of a large wing bolt. After the bolt was inserted through the cap, a graphite impregnated asbestos gasket the size of the pipe opening was slipped over the bolt end into the recess of the cap. A flat washer was next, to hold the gasket in place, and a cotter pin placed through a hole in the bolt held the assembly together.

A 2 inch length of 9/16 inch tube, tapped out to 7/16 inch USS, was located in the center of the aft end of the blowout tube by welding 3 supports at 120° angles from each other.

The wing nut, turning in the cap, screws into the small tube and pulls the plug over the aft end of the blowouts until the big pipe seats against the asbestos gasket. Because the cap itself does not turn during the operation of removing or replacing, chances of it binding are negligible.

The opposite side was made in the same manner. It must be remembered that each side should be fit up individually because one bank of cylinders on the V8's is offset from the other which will change the pipe lengths in relation to the chassis.

After both sides had been completed, they were carted off to the platers for



The above overall view illustrates the left side of the complete exhaust system showing header, the pipe attachment flanges and the phantomed muffler and the tailpipe locations.

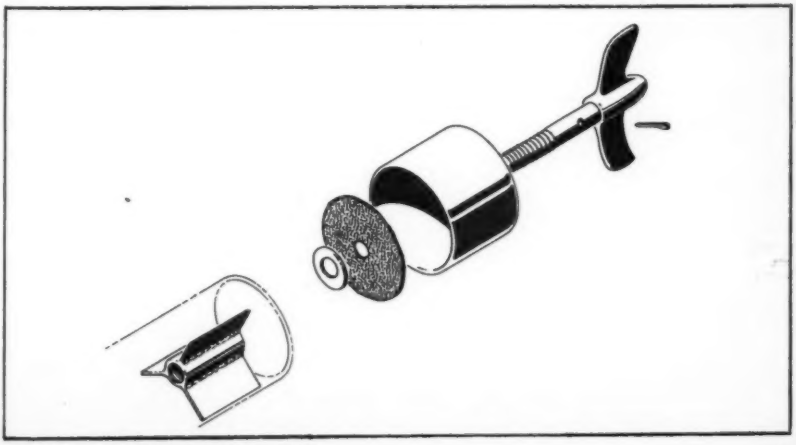
the chrome treatment. This not only greatly enhances the appearance, but the prevention of rust is an important factor well worth the added expense.

With the complete system installed, the car was given a trial run. No drone was evident at any speed inside the car despite the semi-rigid mounting of the mufflers and pipes. The exhaust tones from the tailpipes were inaudible while driving and the low, gentle throbbing was pleasing to those outside.

The noise with the caps removed was not as raucous as might be supposed, but definitely out of keeping except for drag strips, lakes or competitive events.

Whatever variation of this system you may elect to use, keep in mind that high quality workmanship and a little extra time will pay off in added mechanical efficiency as well as greater personal satisfaction. ●

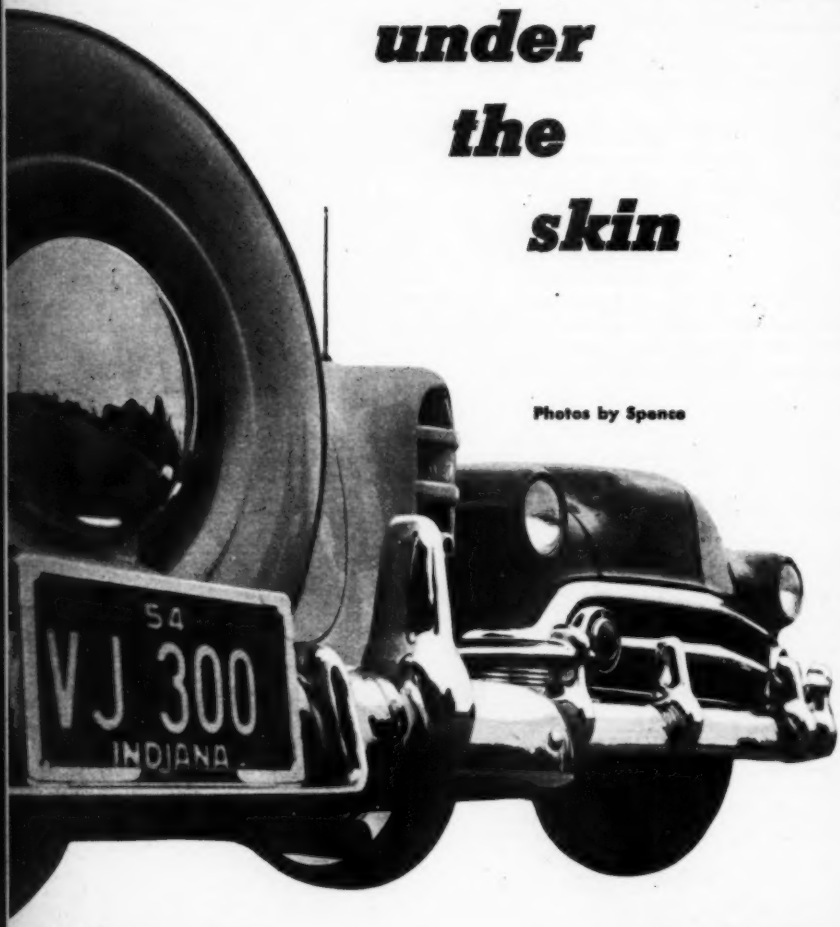
Exploded view of pipe end and cap assembly. The units from left to right are: phantomed exhaust pipe with cap-securing tube and supports, washer, graphite impregnated asbestos gasket, cap, wing bolt and the cotter pin for holding all of the components together.



Two answers for the same problem.

BROTHERS *under the skin*

Photos by Spence



AN UNUSUALLY good chance to visually compare different styling treatments to the same make of car was afforded R & C's roving photographer recently at the Indianapolis Custom Auto Show. The two cars in question are '53 Chevrolets – one a hard-top and the other a convertible. With the two cars parked side by side, it was easy to examine the character and individual treatment of each car and closely compare the ideas of widely separated enthusiasts with but a single thought in mind – *customize!*

Let's take a trip around these cars and see just exactly what changes have taken place in their appearance.

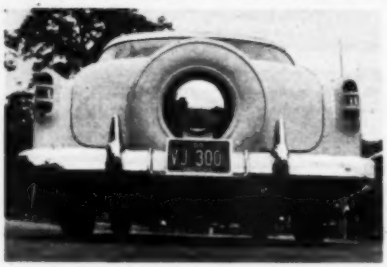
Take the taillights, for instance. The convertible's rear fenders have been extended rearward 7 inches and fitted with '53 Lincoln taillights. The fender lengthening operation has served two distinct purposes. The first, to stretch out the styling of the car thus making it appear lower than it actually is and, the second, to frame the continental tire kit to prevent it from looking like an afterthought that someone had stuck on the car for lack of something better to do.

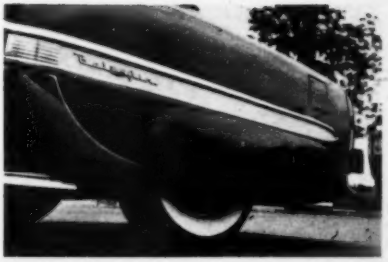
The alternate treatment given the hardtop was accomplished through using DeSoto taillight lenses mounted into a "frenched" frame. The lack of the chrome frame around the light units serves to add length to the rear fenders thus attaining essentially the same effect as used on the convertible – that of adding to the length of the car and framing the visible spare tire.

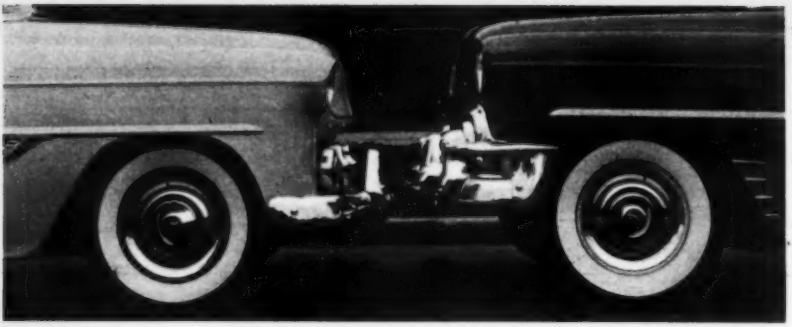
The cars themselves belong to students at General Motors Institute – GMI – located in Flint, Michigan. Because

Cars may appear remotely the same but upon closer look differences in styling become apparent. The hardtop, upper photo, features DeSoto taillight lenses while the convertible boasts extended fenders with Lincoln lights. Both cars were restyled in the Midwest area.

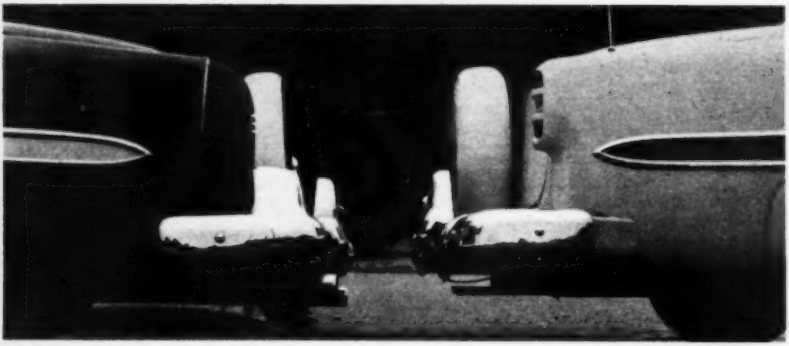
Dennis Eichstaedt's hardtop has had chrome ornaments removed, holes filled, and double chrome stripping extended. Red convertible's rear fenders are stock at forward portion but stock skirts replaced with handformed panels. Convert belongs to Larry Hershey of Michigan.





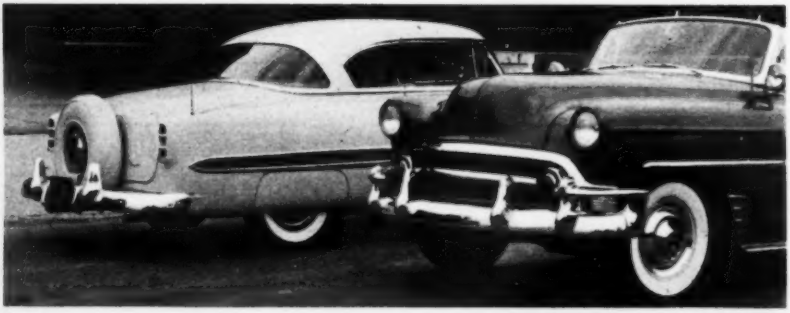


Hardtop, left, has more radical frontal alterations than convertible, has also been lowered to a greater extent. Hardtop's headlights are frenched in '54 Cadillac style while those of the other car are deeply recessed in Ford rims. Both cars were displayed at recent auto show.



Convertible, left, though higher in front, is slightly lower in rear than hardtop. Lincoln lights on convertible are set into fenders extended 7 inches rearward. Taillights of the right hand car are DeSoto lenses frenched in. Fender extending serves to frame spare tire.

Contrast in styling is provided with fore and aft shots of different cars. Grille changes to convertible are removal of vertical bars and installation of fog lights in parklight bases, otherwise the grille is not altered. Both cars feature clean, uncluttered lines.



the school is conducted with several shifts breaking up the majority of the students, the students who own these cars had never met until the custom car show opened.

Larry Hershey, whose home is in Garden City, Michigan, owns the target red convertible. The beige hardtop is the proud possession of Dennis Eichstaedt who makes his home in the Indiana town of Knox.

Eichstaedt's hardtop features a novel, but simple once the idea was born, redistribution of side chrome trim that makes an amazing difference in the overall appearance of the car. The dual chrome stripping that formerly ran the length of each rear fender has been extended forward across the door panels and onto the front fenders terminating in a portion of '53 Pontiac side chrome trim. The effect was made even more noticeable by painting the area between the strips in a vividly contrasting color. The "Bel Air" sign, Chevrolet medallion, gravel shield and rocker panel molding were removed, and the holes filled, so one's attention is drawn toward the parallel side strips instead of toward a mixture of useless ornamentation.

Both the owners saw fit to use modified Chevrolet parts in the creation of different grille treatments. Eichstaedt's hardtop features the original center grille bar, with its vertical "teeth" and parking light housings, mounted seemingly unsupported in an oval opening. Hershey's convertible uses the stock grille but with the several vertical bars removed.

Even the headlight treatments deserve comparison. The convertible has had '51 Ford light rims frenched to the fenders with the bulb units themselves deeply tunneled and framed by a chromed insert. The front fenders then, like the rear, have been extended thus lending the car an appearance of symmetry and balance.

The hardtop's lights bear a marked resemblance to the '54 Cadillac what with the overhanging lip at the top. The shielded effect has been nicely blended into the original fender contour line that previously ended at the light rims.

The one mark of similarity between the two cars is the filling and peaking of each hood after the removal of the strip that originally separated the hood panels and the taking off of the large Chevrolet medallion. The lower corners of the hardtop's hood have been rounded to match the newly designed oval grille opening while the convertible's hood outline remains essentially the same.

The two '53 Chevrolets have been lowered in identically the same manner but varying tastes make themselves apparent when the cars are carefully compared. The hardtop has been dropped – through the use of lowering blocks – in the rear to not quite the extent of the convertible. The front of each car was similarly lowered – by an elimination of part of the coil springs – though this time it is the hardtop that is the lower of the two. The result is that the convertible has the "motor boat" look of many customs while the hardtop sits nearly level fore and aft.

In line with popular additions to cars of all makes and models, both of our examples are equipped with dual exhausts. While those of the convertible end in rather large chrome extensions, beneath the rear bumper, the hardtop's pipes end unobtrusively in the same location – without tips.

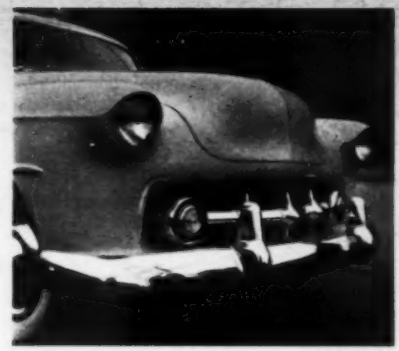
Hershey's convertible boasts handformed fender skirts – covering more of the wheel opening than did those originally supplied with the car – thus adding to the car's lowness by way of an optical illusion. The skirts of the hardtop remain as before.

There is a wealth of more or less new ideas contained in these two cars – nearly all of which could conceivably be incorporated into a single Chevy should the reader be blessed with either of these models or one of the popular 2-door types and should he be desirous of restyling his car to a certain degree.

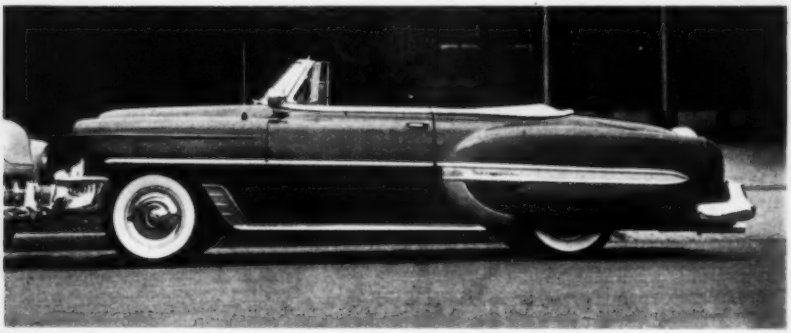
Much credit is due both owners of

these fine cars for in reworking Detroit's original products they have come up with widely separated opinions which, when transformed into metal and paint, mark the cars as being outstanding, not only in craftsmanship but with general appearance as well.

Even some of GM's stylists, who now and then drop by GMI to see how the various classes are progressing, have raised their eyebrows approvingly when shown these results of metal reshaping and trim relocating. Maybe the forthcoming '55 Chevys will contain one or more ideas "borrowed" from either or both of these student projects, who knows? We'll have to wait for that. ●



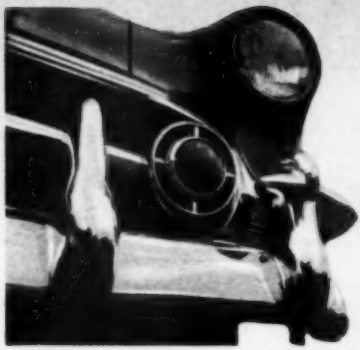
Widely radiused hood corners, new grille oval and frenched, shaded headlights denote latest treatment of customizers to late model cars.



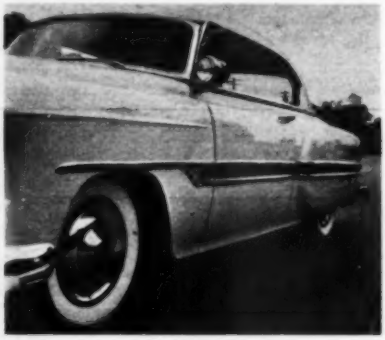
Hershey's convertible is slated for front end dropping in near future to rid it of the tail dragging appearance. Owners of two cars, though attending same school, had not met until time of these photos. Had they met before starting to customize, similar ideas might have resulted.

Eichstaedt's '53 Chevy hardtop *could* resemble the '55 models unless GM changes to new body. Dual chrome stripping is a natural for this car and represents the type of face-lifting that Detroit *might* turn up with for next year. Dropped front and rear, car sits nearly level.

Essentially stock center grille floats in new oval opening formed by reshaping leading edge of hood, fenders and lower gravel deflector.



Foglights mounted in parking light housings serve alternate purpose as directional lights. Note recessed frenched, or tunnelled, light.

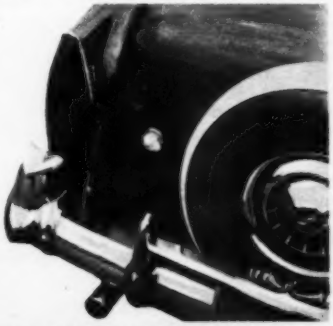


Parallel chrome strips, extended from a stock location on rear fender, terminate on front fenders through addition of '53 Pontiac trim.

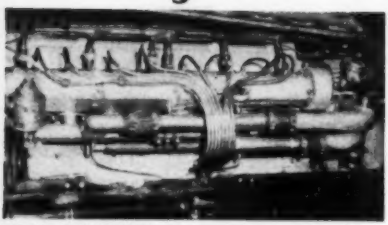
Like earlier '49-52 Chevys, the '53-'54 models are well adapted to customizing. Simple ornament removing reveals clean basic styling.

Lincoln taillights on Hershey's convertible extend to set off spare kit. Both '53 cars are equipped with resonant dual exhaust pipes.

Filled and peaked hood represents only similarity of customizing between the two cars. Eastern customizing rivals that of the West.



WhATSit ?



AN ENGINE, to some people, is a thing of beauty. The mere sight of a power-packed hunk of machinery, like the one above, will start the blood surging in a true enthusiast's veins. Sometimes one can almost imagine himself being hurtled along a roadway with possibly limitless horsepower available at the mere touch of the throttle. Do engines affect you this way? If so, look long and hard at the accompanying photo and see if you can visualize it in your own car.

Before we get ourselves involved in a discussion of psychological reasoning, let's see if we can identify the engine in question. If your knowledge of racing machinery includes the make of this sizeable mill, then you're right in line for a free year's subscription to ROD & CUSTOM.

The rules are simple.

DO NOT include your "Whatsit?" answers in letters sent to R & C's other departments.

Print "Whatsit?" plainly on the face of your card or letter so it can be directed through the proper channels.

Five winners will be selected at random from among the correct answers sent in by readers.

Deadline for this contest will be October 1st. The winners will be announced in the December issue.

Winners presently having a subscription to ROD & CUSTOM will automatically receive a 12 month's extension.

The chance to win is everybody's right. If you know, or at least *think* you know the make of the engine above, jot down your guess on a card and address it to us at 4949 Hollywood Blvd., Hollywood 27, Calif.

It's as simple as that!

The lowest number of correct answers in "Whatsit?" history dribbled into our offices in response to the June query. The photo was of an ancient truck — a pickup type to be exact. The following five people correctly identified it to be a 1907 Chase — which is what it was: Gordy Lippman, Seattle, Wash.; Dick Camden, Marietta, Ohio; Richard Boicheff, Hamilton, Ohio; John Curtis, Newton Centre, Mass.; Roger Imsande, Cincinnati, Ohio.

Congratulations to the above readers and if your name hasn't appeared on the winners lists, keep trying.

variety mart

Nowhere else can you get action like you can in ROD & CUSTOM. For only a dollar you can offer anything for sale or to be sold. Letters from former advertisers in this section continue to come in stating that never before have they gotten such quick action. Many items are bought and sold within two or three days after an issue goes on sale. Why don't you take advantage of this great offer? Just state, in 25 words or less, what it is you want to buy or sell. Then drop your ad, together with a dollar bill, into an envelope and send it to this column in care of ROD & CUSTOM, 4949 Hollywood Blvd., Hollywood 27, Calif.

EXTREMELY RARE! I have two extra copies first issue HOP UP Magazine, July '51. What am I offered? Both in excellent condition. Robert Johansen, 4630 La Canada Blvd., La Canada, Calif.

EXPERT CUSTOM MAN wants evening work. So. Calif. area. Any and all types custom work. Reference: '49 Chevrolet, June and Sept. '52 HOP UP Magazine. Phone EMpire 9-2839.

FOR SALE! Rare, customized Lincoln Continental convertible. Featured Oct. '53 HOP UP & MOTOR LIFE Magazine. In excellent shape. $1,200 takes it! Bob Snyder, 473 E. San Jose, Burbank, Cal. THornwall 2-7709.

(Continued on page 62)

Did Don Yates really go 144 mph in 8.9 seconds on a drag strip? Here's what actually happened!

how F-A-S-T did he go?

by Barney Navarro
Additional technical assistance by P. W. Pichel, Registered Mechanical Engineer

IN VIEW of the following letter, and many others similar to it, we felt it best to go a little deeper into this business of acceleration.

I am writing to ask for verification of the elapsed time of the Yates-Mikkelsen dragster during its runs on the quarter mile. Is the 8.9 secs. time correct? If so, please explain why. Roger Huntington, a well known automotive writer and an indisputably accurate technical author, says: "Taking into consideration tire traction and weight distribution, my slide rule suggests that about 10.1 seconds would be the low limit for a rear drive car on the standing quarter." I am inclined to go along with this. By using the method suggested by Mr. Huntington for determining the distance a car will have traveled in a specific amount of time, I have determined the PROBABLE acceleration curve of the Y-M dragster.

It is an odd curve since it is a straight line up to 140 mph. The car, according to the graph, would accelerate to 60 mph in 2.4 secs., 100 in 4 secs. and 140 in 5.6 secs. Then the curve would have to flatten out and continue at 144 mph to the 8.9 sec. point. The curve would then give the car a 8.9 second time for the standing start quarter mile. However, accelerating to 140 mph in 5.6 secs. would require 113% tire coefficient all the way up from 0 mph. You have stated that 100% efficiency has been exceeded, but can a car accelerate to 140 mph with OVER 100% efficiency?

This seems very improbable to me since tire coefficient drops rapidly as tires get hot and the tires would have to be spinning all the way to 140 mph. PLEASE clear me up on this as I am quite confused.

By the way, in your comparison of the dragster's time and that of a person

falling from the Empire State Building, the person would hit BEFORE the dragster finished. According to the acceleration of gravity, an object would fall 1250 feet in 8.82 seconds, or .08 secs. faster than the car.

Jerry Crabtree San Francisco, Calif.

Our article covering the Yates-Mikkelsen car in the June '54 issue of R & C purposely omitted some technical oddities that we discovered. At the time it was felt that formulae and computations would be of no interest whatsoever. We felt that our readers would be more interested in *what* the dragster did instead of *how*. Now it seems that our first assumption was wrong. Some of our deep thinking readers have requested more concrete evidence of the claims made for the car.

Considerable reference has been made to previous articles and formulae relating to acceleration. All of the computations, that dispute the possibility of the Y-M dragster attaining the speed of 144 mph in the quarter mile and covering the distance in 8.9 seconds, are based on one fallacy. This fallacy seems to vary with the beliefs of each individual authority in the field. Although we have not been able to locate tables to support the convictions of those that have submitted formulae, we still find all sorts of computations based on *assumed* tire traction. Unless data can be made available, covering the coefficient of friction of the *specific* type of tire employed under conditions similar to those experienced on the dragster, no computations can be safely made.

A few months ago we printed a formula that purported to show the maximum speed obtainable in the quarter mile. The mathematics of the formula was *absolutely correct!* The conclusion inspired by the formula could also be correct if we could accept two assumptions. To have any true value, the .7 coefficient of tire friction would have to be a dependable figure. As previously stated, there are no tables available to either dispute or substantiate the .7 figure, but we are completely satisfied that it is wrong. The formula also applied to a car with a constant rate of acceleration – such a condition can never exist with a dragster.

If the Yates-Mikkelsen dragster had maintained a constant rate of acceleration while negotiating the quarter mile in 8.9 seconds, its final speed would have been over 200 mph. To cover the quarter mile in 8.9 seconds at a constant rate of acceleration requires an acceleration of 33.3 feet per second per second. At this time we must point out that the acceleration produced on a falling body by gravity is only 32.3 feet per second per second *in a vacuum*. These two acceleration figures make it quite obvious that Don Yates covered the quarter mile *faster* in a horizontal plane than he could have traveled falling freely in a vacuum. Skeptics will point out that to do so requires a thrust being applied to the pavement that is greater than the weight of the car. This we will not deny nor will be claim to know how it was done. All we can say is the deed was done and we have some theories as to *how* but our position is the same as the other theorists – we have no tables, either.

The formula and computations employed in obtaining the 33.3 figure are as follows:

$$a = \frac{d}{\frac{1}{2}t^2}$$

a = acceleration
d = distance
t = time
time is 8.9 seconds
distance is 1320 ft. (¼ mile)

Substituting in the formula, we have:

$$a = \frac{1320}{\frac{1}{2}(8.9)^2}$$

$$a = \frac{1320}{\frac{1}{2} \times 79.21}$$

$$a = \frac{1320}{39.6}$$

a = 33.3 feet per second per second.

In our quest for further evidence as to what occured when Yates screamed down the drag strip, we must approach

the problem from another direction. The clocks indicated that he was traveling at a speed of 144 mph at the finish line. This speed converted to feet per second is 211.2 feet per second. Now we must apply a very simple formula to determine his average rate of acceleration. A formula really isn't very necessary as will soon be readily apparent but we will nevertheless go through the motions:

$$a = \frac{v}{t}$$

a = *average* acceleration

v = velocity = 211.2 ft. per sec.

t = time = 8.9 secs.

so:

$$a = \frac{211.2}{8.9}$$

a = 23.7 feet per second per second.

Now that we have the average rate of 23.7 feet per second per second we shouldn't jump to any conclusions. This figure is *not* the rate at which the car accelerated, merely the *average* rate. In other words, the car could have accelerated for a few seconds at a rate double this amount and conversely for a few seconds at less than the average. The net result of the various rates of acceleration produced the 23.7 average. We won't ask you to wade through the application of another formula to compute the distance traveled in 8.9 seconds with a constant rate of acceleration of 23.7 feet per second (note: we said *constant* – not average) but, we will give you the figure so that the obvious impossibility will be apparent. In 8.9 seconds only 938.5 feet could have been covered if the *average* rate of acceleration had also been the *constant* rate. For those who would like to work it out for themselves, we submit the formula:

$d = \frac{1}{2}\ at^2$

If you are still with us it should be obvious that something highly unusual took place. If you've been lost in the scramble, you'll have to take our word.

In order to traverse a distance in 8.9 seconds with an *average* acceleration of 23.7 feet per second per second, a feat that would require a constant rate of 33.3 feet per second per second, a rate of far in excess of 33.3 feet per second per second would have to be attained for a period of time in order to reduce the overall time. We are fully aware of the fact that by the standards of present information on tire traction we can afford no explanation of how Don Yates could accelerate faster than 1 g, but it is also obvious that he must have accelerated for a considerable distance at better than 1 g. He may have even accelerated at a rate of 45 feet per second per second. We have no way of knowing because there was no means employed to check his acceleration curve. The only figures that are available are these.

For those that think the 8.9 time figure is wrong, just remember that he again traversed the quarter mile at a notably *slower* drag strip in 9 seconds flat. One tenth of a second more or less cannot disprove the possibility of the accomplishment. The fact that 2 different drag strips should record the time within 1/10 of a second should be evidence that the clocks weren't wrong.

No one can say for sure how the dragster obtained the necessary traction but there are a couple of theories. One explanation suggests that the tires, with an air pressure of only 6 lbs. per square inch, have a tendency to conform to the configuration of the pavement. In this way their action would more closely *gearing* than *friction*. The other theory has been expressed in our letters to the editor column, tires that are spinning can transmit more thrust to the pavement than the pressure applied to the pavement by the weight of the car. In other words, a tire that supports 600 lbs. of weight can produce a thrust on the pavement of *more* than 600 lbs. if it is spinning its circumference at a rate faster than the distance than is being covered. The assumption in this case is

that the friction between the tire and the pavement is increased by slippage. The tire is *cooled* by coming in contact with fresh cool pavement as it travels down the course plus the rush of air over its surface.

Considerable fuss is going to be raised over the fact that the car has four wheels and only the rear two supply the thrust. Yes, we agree, the whole weight of the car is not resting on the rear wheels so they have an even more difficult task to produce a thrust greater than 1 g. However, a reaction does take place that assists the tires in their task. The terrific torque applied at the rear wheels causes a weight shift. The torque attempts to lift the front wheels as often happens with racing motorcycles when the clutch is engaged with the engine revving up. The torque reaction of the dragster can reduce the weight on the front wheels enough to make it necessary to use excessive caster to maintain control. Even then, it has a rather vague directionably close to the starting line.

Our comparison, between Don Yates covering the quarter mile and a man falling from the Empire State Building was a rather underhanded trick. Although the Empire State Building is only 1250 feet high (70 ft. short of a quarter mile), it would take a man *longer* to reach the ground in a free fall because of the effect of wind resistance. A man can only attain a velocity of approximately 120 mph in a free fall. A building *twice* as high as the Empire State Building would still only result in a falling velocity of the same speed.

We admit that the figures relating to the Yates-Mikkelsen machine may look like an impossibility nevertheless we're sure that the deed was done. Although much time has been spent in conjecture, we would also like to know how it was done.

And, if and when we do find out, someone else may have exceeded the 144 mph figure so we'll have to start all over again!

At the suggestion of one of our readers, see Correspondence "Acceleration", we have had the above figures checked for accuracy by a leading mechanical engineer. In addition, he suggested the inclusion of additional data which applies to the Y-M car. Therefore, read on . . .

In analyzing the performance of the Y-M car, the fact that a speed of 144 mph was reached in 8.9 seconds is not hard to justify on the basis of the *required average* acceleration, calculated as follows:

$a = \frac{v}{t}$ where, $v = 144$ mph (211 ft. per sec.) and, $t = 8.9$ secs.
therefore,

$a = \frac{211}{8.9,} = 23.7$ feet per second, or $\frac{23.7}{32.2} = .735$ g. . . . where g is the acceleration at sea level of a body falling freely in a vacuum.

However, when it is also taken into account that a distance of one quarter mile (1320 ft.) was covered in the 8.9 sec. time, it becomes apparent that the maximum acceleration reached during the first part of the run *must have been much higher* than the average value for the distance traveled in 8.9 secs. assuming a constant acceleration of 23.7 ft. per sec., we find that only 938 ft. rather than 1320 ft. would have been covered: $d = \frac{1}{2}at^2$, where $a = 23.7$ ft. per sec., $t = 8.9$ secs. $d = \frac{1}{2} \times 23.7 \times 8.9^2 = 938$ ft.

To further illustrate this point, we can calculate the constant acceleration which would be required to cover 1320 ft. in 8.9 secs., using the same formula as above:
$d = \frac{1}{2}at^2$, $a = \frac{2d}{t^2} = \frac{2 \times 1320}{8.9^2} = 33.3$ ft. per sec.

However, the speed reached at the end of the 8.9 secs. would be much greater than 144 mph: $v = at = 33.3 \times 8.9 \times \frac{15}{22} = 202$ mph.

The least possible instantaneous acceleration which must have been attain-

(Continued on page 59)

THE BARRIS KORNER

Converting early Ford trunk latches to pull cable operation

THE PROBLEMS to be encountered with the filling of deck lid handle holes have been widely discussed in the past. There is one question that, though it is always encountered, has never been satisfactorily answered if the amount of correspondence pertaining to it is any indication. That problem is the installation of a pull-cable type of latch.

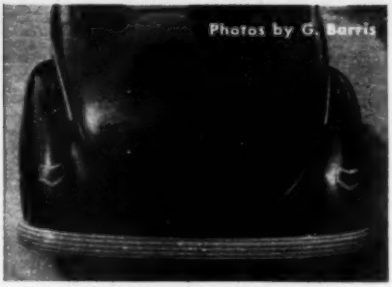
Many of the articles written about cars built at our shop have said, "... the deck lid was filled and is now opened by a pull latch"– and that's all.

To answer, then, the many inquiries we have received regarding pull cable operation of the deck latches on the earlier model Fords, here is a photographic step-by-step of the procedures required. Before we begin, however, a rundown of the tools and materials required is in order.

TOOLS: A screw driver, a 7/16"-½" open end wrench, a hammer, a punch, an electric drill, a ½" and a ⅛" drill.

MATERIALS: Hood latch cable (or similar flexible, sheathed cable available at most auto accessory stores), an 8" length of ¼" square steel stock, a throttle stop, several ⅛" metal P. K. screws and washers.

The whole job shouldn't cost over $4.00 or require much more than an hour of spare time so if you have had your deck lid filled but are lacking the know-how for a latch set-up – here is how it is done:



A

Early Ford trunk latch assembly is removed by unscrewing nuts and bolts from beneath the lid. Lock base and handle assembly can be taken from lid after license light wire is disconnected.

B

The pull lever latch arm may be installed in latch mechanism next, so the inner assembly is removed. After screw removal, the latch may be slid out of access hole provided in deck panel.

C

Lever made from square stock is inserted and held in place with nut and lock washer. Note hole in extreme end of arm for securing pull cable. Latch can now be replaced in deck lid.

D

Latch assembly is here being replaced. Notice that the lever arm points to right hand side of car. Latch will not work if arm is inserted backwards due to direction lever must travel.

E

A ½" hole must be drilled in the package tray Panel behind the rear seat. Pull cable is put through hole and held firmly with a lock nut. Location of T-handle will vary on other models.

F

Determine location of pull cable beneath deck lid and punch or drill an eighth-inch hole. This will secure cable in position. If cable is installed loosely, latch will not operate.

G

A small rubber insulated clip, or a piece of metal cut from scrap material and wound with masking tape, will keep the sheathed cable from movement which would prevent operation.

H

Final step is the insertion of the end of the wire cable through the hole in the lever arm and securing it with a throttle stop. Entire project shouldn't require over one hour time.


A


B


C


D


E


F


G


H

TECHNICAL TIPS

"HIGH PERCENTAGE CHEVY" QUESTIONS

Concerning the custom Chevy in your April issue. What happened to the ventilator windows (windwings) and how was the door glass frame curved? It used to be square to match the forward end of the missing quarter windows.

Bob Whitlock Nokomis, Ill.

Does Leon Welmas' padded top fold down?

Warren Griffen Stamford, Conn.

• *At the time the photos were made, the windwings in Leon Welmas' Chevy were still under construction.*

A new channel frame was made for the door windows from stock approximating that used originally.

The top used on the car can be removed in its entirety but it cannot be folded. *Tech. Ed.*

LOWERING

I have a '50 Chevrolet that I am attempting to customize. I would like to lower it but have heard that lowering blocks could cause trouble to the rear end or the universal joint. Is this true?

Eddie Doyle Canton, Mass.

• *Lowering blocks up to 4 inches in height shouldn't cause any mechanical trouble. To go beyond this would put undue strain on the universal joint. The rear end could only be damaged by coming in contact with the frame while crossing a severe bump. Axle housings have been bent by severe bottoming.* *Tech. Ed.*

COSTS WANTED

I've been reading R & C for a long time but have yet to see you quote prices on any of the cars customized by professional shops. Why?

Jack Healey Berkeley, Calif.

• *We quote prices whenever the car owners give us permission to do so. Many of them do not wish to have their financial matters discussed openly.* *Tech. Ed.*

TIPS WANTED

Could you give me a few tips on customizing my 1950 Mercury 4-door? I would greatly appreciate any suggestions you might have.

George Barnhafer Milwaukee, Wis.

• *Sorry, George, space and ethics do not permit us to make any restyling suggestions. Suggest you refer to the '49, '50 or '51 Mercurys that R & C has featured in past issues.* *Tech. Ed.*

TRANSPLANTING H P

We have been reading your fine magazine for some time and think it is tops. We would, though, like to see more about engine conversions since we have very few around here.

We would like to install one of the late ohv engines in our '51 Mercury and '49 Ford. After weeks of discussion and many trips to agencies we have eliminated all but the following three engines: Oldsmobile, Cadillac and Buick. We have heard a few rumors against the Buick and would like to know a little more about this engine. Which engine would you recommend and which would be the least amount of trouble to install in either of our cars?

Roy L. Cox,
Carroll Jensen, Jr. Panama City, Fla.

• *Each of the three engines you mention could be readily installed in either car. Rumors currently going around concerning the Buick are, as far as we are able to determine, groundless and the engine is as efficient and reliable as the other two listed. The Oldsmobile engine, though of a less horsepower rating than the Cadillac, provides more crank bearing surface and a heavier block casting. More speed equipment is available for the latter than for either of the other two. However, the final decision is up to you.* *Tech. Ed.*

FENDER SWITCH

Are there any other rear fenders that could be used to replace the stock ones on a '46 Ford club coupe?

Sonny Antes Milwaukee, Wisc.

• *The rear fenders from '41 through '48 Ford and Mercury are interchangeable but the stampings are so similar that the change would not warrant the trouble. There are no other fenders with entirely different contour lines that could be used without much rework.*

Tech. Ed.

ONE PIECE WINDSHIELDS

I would like to know if it is possible to put a one piece windshield in a '48 Ford coupe?

Jerome Wingert Omaha, Nebraska

I have a 1940 Oldsmobile 2-door sedan. It has a two piece windshield and I feel it would be nice to have a full one.

I would like to know how to do this as well as what windshield to use.

Bill Bellinger Vancouver, Wash.

• *One piece windshields, either curved or flat, can be installed in either of the cars in question but the work involved would necessitate extremely radical body alterations. In both cases the charges would probably exceed the worth of the cars.*

Tech. Ed.

USE OF PLASTIC

I have recently become interested in customizing and in restyled cars. I have a '51 Mercury that I would like to rework and was wondering of the advisability of using plastic or fibreglass to fill in holes, seams, etc.

Keep up the good work on your fine magazine.

Roger Ewbank Bremerton, Wash.

• *Experiments are still continuing in regards to bonding plastics and metal. The kits offered by several R & C advertisers will work providing the panels so treated are not subject to undue vibration in which case the bond between the plastic and the metal could break.*

Tech. Ed.

HOW FAST

(Continued from page 54)

ed in order to cover the quarter mile in 8.9 secs. from a standing start and without exceeding 144 mph can be calculated by assuming a period of constant acceleration to a speed of 144 mph followed by an additional time at a *constant* speed of 144 mph.

$d = \frac{1}{2}\, a(t_1)^2 + Vmax\ (t_0 - t_1)$

where $d = 1320$ ft.

$Vmax = 144$ mph $= 211$ ft. per sec. per sec.

$t_0 = 8.9$ secs.

t_1 = duration of period of constant acceleration.

as, $a = \dfrac{Vmax}{t_1}$

$$d = \tfrac{1}{2}\,\frac{Vmax}{t_1}(t_1)^2 + Vmax\ (t_0 - t_1)$$

$$1320 = \frac{211 \times t_1}{2} + 211\ (8.9 - t_1)$$

$$105.5t_1 = 1880 - 1320 = 560$$

$$t_1 = 5.31 \text{ secs.}$$

$$a = \frac{211}{5.31} = 39.7 \text{ ft. per sec. per sec.}$$

Thus we see that a distance of one quarter mile can be covered in 8.9 secs. at a maximum speed of 144 mph if the car accelerates at 39.7 ft. per sec. per sec. for the first 5.31 secs., at which time a speed of 144 mph has been reached, and then continues at a constant speed of 144 mph for the rest of the 8.9 secs.

Now, the question is, can an acceleration which exceeds the acceleration due to gravity be attained? Knowing the weight of the car, we can calculate the driving force which must have been present between the ground and the rear tires to produce this ratio: $f = ma$,

where m = mass of car $= \dfrac{\text{weight}}{g}$

$$f = \frac{1200 \times 39.7}{32.2} = 1490 \text{ lbs.}$$

To achieve a driving force at the rear wheels greater than the weight of the entire car, advantage must be taken of three factors:

(Continued on page 64)

READER'S CAR OF THE MONTH

TOP CONTENDER for our "Reader's Car of the Month" title is Johnnie Stader who hails from Indianapolis, Indiana. A member of the Indianapolis Modockers", Johnnie's pride and joy is this '49 Ford club coupe.

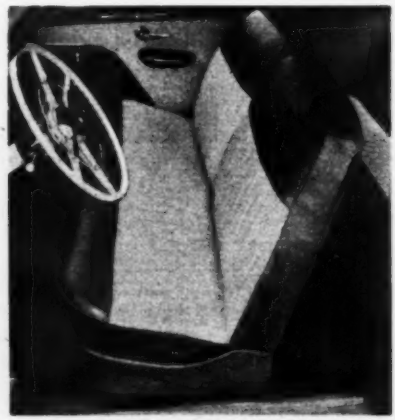
Beginning at the front of the car, we see that John has built a grille using a Henry J center grille bar and a '49 Cadillac top bar as the basis for his conversion. The front bumper formerly supplied protection to a '49 Stuebaker while the guards are '50 Stude moved outward from their original location.

Body work consists of filling the familiar gap in the nose of the hood and frenching the seams that originally separated the rear fenders from the quarter panels. The stock taillights were replaced with those from a '51 Ford which are mounted in conjunction with the later Ford windsplit. The windsplit, or fairing, instead of being chromed, has been painted to match the car.

The rear bumper, sporting dual exhaust tips, came from a '50 Mercury. Altering it to fit the Ford consisted of narrowing it 10 inches, then rechroming.

Cut down '51 Mercury fender skirts, a set of '53 Cadillac hubcaps and a paint job of dark metallic blue completed the car from all outward appearances.

New interior upholstery was done in blue and white piped leatherette and the dash and steering wheel painted to match. A thoughtful addition was the



installation of '49 Chevrolet rear seat arm rests incorporating conveniently located ashtrays.

The engine, rebored to provide 276 cubic inches, is started by pushing a button located in the extreme end of the gear shift lever.

Your car probably rates space on this page. Merely photograph it from several angles, being sure to include detail shots of body work or other interesting features, and send it to us along with a full rundown of the work involved and a short paragraph concerning yourself. That's all there is to it. If your car is selected as the "Reader's Car of the Month", you will receive a year's subscription to R & C. ●

JUST RIGHT

Continued from page 33)

A 59L V8 block was found and Bruce turned his untiring efforts to this latest addition for his Just Right coupe. Bored to 3⅜" and stroked to an even 4", ported, relieved and fitted with a Winfield SU 1R cam, the mill also received 30 degree intake and 45 degree exhaust valves, Evans heads and triple intake manifold, H & C distributor and Belond headers firing into twin mufflers.

The coupe's latest display was at the Indianapolis Custom Auto Show, held during the week preceding the "500" race. Unfortunately, the car cannot hope to compete fairly against some of the radical custom cars built from the frame up, nor can it hold its own against some of the T-, or A-bodied competition roadsters that always make their appearance at shows of this type. However, this doesn't phase Bruce Hale in the least. His black car, in the estimation of all who have seen it, rates as being the cleanest '40 Ford in captivity – a tribute to the Just Right coupe. ●

VARIETY MART

(Continued from page 50)

NEED informtion on hopping up Kaiser nd Willys engines. Fred Schmidt, 1615 Catalina, Burbank, Calif.

SELL. CRAGAR HEAD complete, new valve job, big ports, Burns single manifold. Asking $100.00. Need good left rear fender and original bumper for '32 Ford. Gene Crosby, Paradise Camp, Bishop, Calif.

FOR SALE! Hard-to-find doors and windshield with brackets for '27 T roadster. Condition good. Make offer. Robert Johansen, 4630 La Canada Blvd., La Canada, Calif.

SELL! Chrysler V8 dual manifold – Edmunds. Brand new! $60.00. Also have air filter for same. Nick Bianco, 2100 Flournoy, Manhattan Beach, Calif.

FOR SALE. 1937 Ford four door convertable sedan. Good mechanical condition, leather upholstery. Body and fenders very good. Top poor. David Carew, Green Lake, Wisconsin.

ACCESSORY INSTALLATION

(Continued from page 29)

Rotate the exhaust valve push rod between your fingers, with #1 cylinder on firing stroke, at the same time edging the engine over with the aforementioned jumper wire. When the push rod stops rotating, or when the lifter begins to rise, stop edging the engine and set both adjustments on the rocker arms of the following cylinder in firing order. (Example: set adjustments on both rocker arms for #8 cylinder – furthest rearward cylinder on right bank.) Set the intake rocker arm clearance at .005", on a cold engine, and the exhaust at .007". Continue this procedure going to #4 cylinder, the next in firing rotation. Proceed until all 8 have been adjusted.

Note: Be careful when tightening the lock nuts on the adjusting set screws. Tighten firmly, but not viciously. You could either strip the threads on the set screws or break the rocker arms.

Replace the spark plug in #1 cylinder, the rocker arm covers (using new gaskets) and the spark plug wires, then fire away!

Warm the engine to approximately 180 degrees – then shut it off. Leave engine alone for a few minutes so that the oil beneath the rocker covers can drain back to the crankcase.

Now – and it's very important – remove #1 spark plug, plug wires and rocker covers and repeat the procedure all over again. This time set the exhaust clearance at .005" and the intakes at .003". (With a stock cam.) Once again replace the component parts and road testing is in order.

If you have faithfully adhered to the listed steps of the foregoing, you should have no noisy tappets or rocker arms.

Previous method of adjusting rocker arms is for solid lifter action. If hydraulic lifters have been retained, set as prescribed by the manufacturer, or stock. If your cam has been reground other than stock, set clearances to cam regrinders specifications.

Charge! ●

Can *You* Guess...

...which automotive magazine has had more generally informative technical articles?... which automotive magazine has featured more hot rods and customs?... Which automotive magazine has presented more of the things pertaining to reworked cars that would interest you?... than any other pocket sized publication, and with only 16 issues?

CAN *You* GUESS...

...which automotive magazine has had more *exclusive* coverage like the following... World's First Jet Propelled Car — The Smallest V8 Engine in the World — The Formula for Maximum Acceleration Attainable — One of the Country's Most Outstanding Custom Cars, the Polynesian — than any other pocket size publication?

CAN *You* GUESS...

...which automotive magazine's editors are so genuinely interested in their readers that... they are having a custom car built entirely from suggestions sent in by their readers?... they braved the hardships of towing a competition car to the Bonneville Salt Flats behind a hot rod so that readers would know what to expect when they trekked to this far-distant speed spot?... they have travelled, in a short year and a half, over 30,000 miles (by car) to bring you the finest and most complete coverage of cars and events in the country?

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You can't beat coverage like that — no matter how hard you try.

Does your back issue file include those issues listed below? If not, better grab them while they're still available.

MAY, 1953

Barney Navarro explains gear ratios. Custom '51 Oldsmobile, '50 Chevy, '50 GMC pickup.

JUNE, 1953

Exclusive coverage of the first jet propelled car! Two Ford customs and three rods.

DECEMBER, 1953

Bonneville National Speed Trials. George Barris discusses chrome stripping. A trip to Bonneville in a roadster. Top record holding cars.

FEBRUARY, 1954

Comparing a Barris Buick to a 1910 Antique. What you should know about pistons. Installing sealed beam headlights on street rods.

MARCH, 1954

The smallest V8 engine in the world—exclusive! Mounting overhead pedals. Adding airscoops to your car. Hopping up the Buick V8.

APRIL, 1954

Complete review of R & C's first year. Chevy custom convertible. Explaining dual carburetion trouble-spots. Installing Hi-Lift rocker arms.

MAY, 1954

How to chop a top. Stroking vs. de-stroking. Lincoln Capri custom. Fabulous modified T.

JUNE, 1954

How to chop a top, Part II. Hop Up road test. *Fastest accelerating car in the world!*

JULY, 1954

The whys and wherefores of engine porting. Fabulous sectioned Ford. Two hot rods from the deep South. How to arch a frame.

AUGUST, 1954

Building a dual purpose exhaust system. Valley Custom Shop constructs a custom dashboard. New insert for '32 Ford top.

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HOW FAST

(Continued from page 59)

1) A torque reaction exists which attempts to rotate the entire car in the opposite direction from that of the rear wheels, thus tending to reduce the weight on the front wheels with a corresponding increase of weight on the rear wheels. Sufficient data on the car is not available to calculate the magnitude of this effect, but it might be reasonable to assume that 1,000 lbs. was on the rear wheels during acceleration.
2) A negative lift effect is to be expected as a result of air flow over the top of the car and between the car and the ground. Although this effect is negligible at low speed, it may be of appreciable magnitude at the higher speeds, with the result that the downward force of the car on the rear wheels is increased. Without wind tunnel data on the car, this aerodynamic force cannot be calculated; however, for the sake of argument, let's assume the force amounts to 200 lbs. on the rear wheels at 100 mph or a total of 1200 lbs.

3) To achieve a tangential, or driving, force of 1490 lbs. with a total downward force of only 1200 lbs. (the weight of the car), it is apparent that the coefficient of friction between the tires and the ground surface must be greater than 1 g. In fact, $\frac{1490}{1200} = 1.2$ g.

Although it is not generally recognized that the coefficient of friction for two surfaces can exceed 1.0, there is a definite dividing line between the point where friction stops and positive engagement, as exists with meshed gears, begins. In view of the low pressure carried in the rear tires of the Y-M car (6 lbs. psi), it is quite possible that a condition approaching positive engagement existed between the tires and the relatively rough ground surface, resulting in an apparent coefficient of friction exceeding 1.0.

As a further check on the possibility of achieving an acceleration of at least 39.7 ft. per sec. per sec., suppose we calculate the horsepower required at the wheels to give the necessary accelerating force of 1490 lbs. at the time the speed reaches, say, 75 mph.

$$hp = \frac{F \times V}{550} = \frac{1490 \times 75 \times \frac{22}{15}}{550} = 298$$

As the maximum engine output was 400 hp, it is seen that sufficient power should have been available to accelerate the car at 39.7 ft. per sec. per sec. at 75 mph, although if we were to make the same power calculation at 100 mph we would find that the available power to be insufficient to maintain this rate of acceleration. This substantiates our previous statement that *the acceleration must have been even greater than 39.7 ft. per sec. per sec.!* A higher acceleration than this would be necessary at the lower speeds to offset the reduction in acceleration at the higher speeds when the available engine output becomes a limiting factor. ●

...And, that should answer all your questions. *P. W. Pichel*

EDITORIAL

(Continued from page 9)

Apparently, in order to attain the fastest land speed, the vehicle does only have to indirectly touch the ground. Thus a cable, supported by towers, would, in effect, be in contact with terra firma while the run was being made.

We are absolutely not inferring disrespect of Lt. Col. Stapp. In fact, he is due heartiest congratulations and sincerest thanks for venturing into the 420 plus speed realm. However, the late John Cobb conceived, and had built, his own automobile and it was his hand that guided it at Bonneville.

Exactly the opposite of Cobb, Lt. Col. Stapp was assigned – after having volunteered for special assignment – to ride the sled, not for the sheer glory of speed, but in the interests of medical science. Someone had to determine the stupendous effects of acceleration and deceleration as imposed upon a human body in order to gain a giant stride along the road to space travel and to observe the conditions of bail-outs from conventional aircraft at supersonic speed. No one had ever before been subjected to acceleration 10 times the pull of gravity – or deceleration of 22 g's. At least, no one had ever lived to tell about it. *He* did it and survived – successful conclusion of one of the world's most dangerous undertakings.

Future manned sled runs are being planned that will approach or even surpass the 800 mile mark, possibly even before this sees print. If this happens, the automobile has lost its chance for the highest speed honor obtainable – and it has no chance to regain the position unless Bonneville is artificially lengthened or unless another similar location is discovered somewhere.

In view of the fact the machine is driven by the combined thrust of many rocket motors and that the machine itself includes no mechanically moving parts to assist itself in forward movement, why does the Air Force not lay claim for a new speed record for a non-mechanically motivated vehicle? This record is, or *was*, held by an ice boat.

Thus, auto speed enthusiasts have been unrightfully robbed of a title that they themselves created. We lost it once before to a locomotive but succeeded in regaining it again. If 700 or 800 miles per hour is reached by the Air Force sled, say farewell to the Land Speed Record forever – unless a revolt can be stirred up and FIA in Paris, France, is moved into doing something about this. ●

NEW 1954 DAYTONA RECORDS ON PUMP GASOLINE PROVE HOWARD CAM SUPERIORITY

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2nd—Nichols' Cadillac-Chev fendered coupe 129.50 MPH

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You can have this same kind of performance for your own car. We know that 99% of all specially equipped cars are burning gasoline. For that reason, we also cite the winning performance of: GEORGE SMITH'S 1937 Ford Pickup which holds the Santa Ana ¼-Mile Drag Record at 110.80 mph. This truck has never been beaten in a year's running. Also—George Cerney's Oldsmobile Holiday Coupe which consistently runs 102 mph at Santa Ana Drags and holds the "D" Gas-Class 3rd Place at 1953 Bonneville Speed Trials. Both of these cars not only run gasoline, but also are driven daily on the street. Each is Cadillac equipped and uses HOWARD STEEL-BILLET CAM, HOWARD RACING PISTONS, and our new MAGNESIUM ROCKER ARMS.

Getting back to this gasoline business, (we think it's important) you could get performance from a camshaft whittled from a broomstick—IF YOU WANTED TO RUN $16.00 A GALLON FUELS. Most of us can't afford 'em, and they are not practical or even reliable to use in any engine, no matter what your experience.

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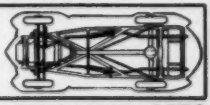

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